BIOS EXPRESS 286

OPERATIONS MANUAL AND
MS™-DOS USER'S GUIDE

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INTRODUCTION

The Operations Manual and MS-DOS User's Guide describes the installation and operation of the Personal Computer Product line and the use of the MS-DOS operating system. Although the four sections of this manual are designed to be used as a set, each is self-contained and can be used individually.

Following is an overview of each section in this manual. For a more detailed description of a section, refer to the Table of Contents for that section.

Section 1, Operations Manual, familiarizes you with your Personal Computer system and shows you how to operate it. Guidelines for using your computer system and an extensive glossary are also provided.

Section 2, MS-DOS User's Guide, describes the MS-DOS operating system and how to use it. This section teaches you about files, filenames, and all the MS-DOS commands.

Section 3, The Linker Utility, explains the Microsoft relocatable linker which is designed to link separately produced modules of 8086 object code.

Section 4, The Debug Utility, describes the use of Microsoft's debugging program that provides a controlled testing environment for binary and executable object files.

As you can see, the more technical topics are described in Sections 3 and 4. Unless you are using your computer for program development, you will only need to use Sections 1 and 2.

Operations Manual

Installing and Operating Your System

FOREWORD

This manual is intended to familiarize you with your computer system, show you how to install it, and teach you about its operation. In addition, the manual contains many guidelines to follow when using your computer system, as well as an extensive glossary of computer terminology.

The computer is available in four basic models, each of which is discussed and illustrated throughout this manual. Follow the instructions for the computer model you have.

Following is an overview of each chapter in this manual along with a table of contents for easy page reference.

Chapter 1, An Introduction, gives you a basic overview of computers and defines the many aspects of both hardware and software. If you have never used a computer before, these pages will help explain the fundamental concepts of a computer system. If you are already familiar with computers, you can skip this chapter and begin with Chapter 2.

Chapter 2, Computer System Components, explains the basic system components and what they do. Diagrams of each component and system board are included in this chapter.

Chapter 3, System Configurations, provides an illustrated review of each computer model.

Chapter 4, Installing Your Computer System, gives step-by-step instructions, accompanied by illustrations, for installing your computer system.

Chapter 5, Using Your Computer System, begins with a special section explaining the basics of your computer system. It then discusses how to load the operating system either through a power on or a reset, and also explains the procedure for system power off.

Chapter 6, Using Your Display Monitor, provides a detailed explanation of the use and adjustment of each type of display monitor.

Chapter 7, Using Your Keyboard, describes keyboard adjustment, gives the location of the special keys on the keyboard and tells how they are used for entering information and for basic system operation. It also explains the MS-DOS function and editing keys.

Chapter 8, System Backup and Regeneration, provides instructions for making backup diskettes of the system files. Once your computer system is installed and running, follow the instructions in this section to create backups. This chapter also provides the steps necessary to regenerate your fixed disk in case something happens to it.

Chapter 9, Taking Care of Your Computer System, provides guidelines for proper care of your computer system and for handling diskettes.

Chapter 10, Using the Serial and Parallel Ports, explains the location and use of these ports and provides pin assignments and switch and jumper settings for the ports.

Chapter 11, Upgrading Your System, provides instructions for adding memory and for exchanging and adding boards to your computer system.

Chapter 12, Changing Your Computer's Configuration—The SETUP Program, describes the SETUP program that you use to change the configuration of your computer.

Chapter 13, A Glossary, provides definitions for the computer terminology used in this manual.

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FOR YOUR NOTES

Chapter One

An Introduction

AN INTRODUCTION

Your personal computer is a tool for information processing, storage, and retrieval. It electronically performs tasks that were previously performed manually, and performs them more quickly and reliably. For example, before you can add a column of 100 numbers, a computer can add a column of 100,000 numbers or more, without error. Many of today's personal computers can store more files and documents than four large office filing cabinets and still retrieve any individual file almost instantly.

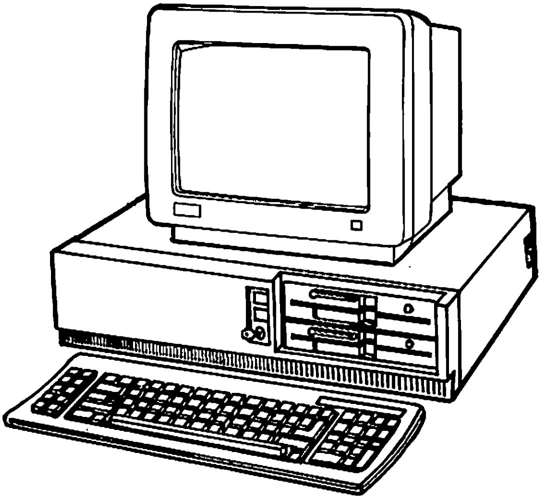


FIGURE 1-1. A PERSONAL COMPUTER

THE TWO SIDES OF THE COMPUTING SYSTEM

The elements of a computing system are divided into two categories Hardware, as described, and Software. Basically, hardware refers to physical components, while software (although it can reside on a physical component) refers to sets of written instructions that the hardware carries out in a precise and logical manner, much like a recipe.

All personal computer systems are made up of the following seven essential components.

HARDWARE

- a microprocessor
- short-term storage
- long-term storage
- input device(s)
- output device(s)

SOFTWARE

- operating system
- applications programs

The remainder of this chapter defines and discusses each of these in turn.

MICROPROCESSOR

Although the terms "personal computer" refers to an entire machine—one that looks like a combined typewriter and television set—the actual computing is done by a single square smaller than your thumbnail, called a chip or microprocessor. A microprocessor is a complete and complex processing unit that resides on single chip housed in plastic or ceramic. The microprocessor is also called a central processing unit or CPU.

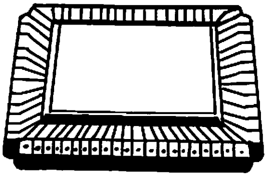


FIGURE 1-2. A MICROPROCESSOR

The CPU interprets and executes the instructions that tell your computer system what to perform.

In much the same way that your brain serves as the processing point for the sensory data you receive, a CPU serves as the main processing point for the data a computer receives. But there is one basic difference between how we process data and how a computer does it. A person adds an element of personal judgment when processing data. A computer system, however, makes no such judgment. Nor can it tell the accuracy or inaccuracy of the data it receives. It simply logically processes the data it is given and returns a result. A computer cannot make a business decision for you, but it can provide information that you can draw upon to make the decision. A computer is a tool and nothing more, but it is a powerful tool that you can use to create meaningful information.

SHORT-TERM STORAGE

To receive, compare, process, calculate, and temporarily store data, the personal computer requires a certain amount of internal memory. There are two types of internal memory—ROM and RAM.

ROM is short for read-only memory. Since read-only memory cannot be written to, it cannot be modified. Usually, ROM contains information that is used often.

RAM, short for random access memory, is memory that can be both read from and written to. It stores information temporarily. When your computer system is on, the information exists, but when you turn the system off, it goes away. The RAM in your personal computer contains the instructions that the CPU is executing and the data on which the instructions are working. As new instructions are executed and new data is worked on, the contents of this memory change. The amount of memory your computer system requires depends on how the system is to be used. (Are there a lot of instructions to execute? Is there a lot of data?)

The standard amount of RAM provided with a computer system should be sufficient for most applications, but more memory can be added if needed. Adding memory to your computer is discussed in Chapter 11.

LONG-TERM STORAGE

Because turning your computer system off means that the information in RAM no longer exists, you need a second kind of storage to record information permanently. Also, you may not have enough internal memory to hold all of your data (documents, worksheets, and so forth) as well as large and sophisticated programs. Therefore, each computer system has another element of hardware consisting of either an internal or a peripheral storage device. An internal storage device resides within the computer system, whereas a peripheral storage device is external to the system. Your personal computer uses internal storage devices. You can also add peripheral (external) devices to your computer.

The three most common storage systems are tape, diskette, and fixed disk. Information is stored on these devices magnetically. Diskettes and tapes are referred to as removable media. That is, they can be removed from the system unit and stored elsewhere for safekeeping and subsequent retrieval. A fixed disk is referred to as a fixed medium. A fixed disk cannot be removed from your system, but the information recorded on it is usually transferred to tape or diskettes for backup and storage.

A diskette is a single flexible surface enclosed in a plastic jacket. The read/write heads of the diskette drive (similar to a phonograph stylus) contact either side of the magnetic recording surface of the diskette through oblong holes, called head slots.

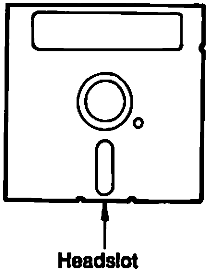


FIGURE 1-3. A DISKETTE

A fixed disk has multiple rigid surfaces for data storage and often has multiple heads for exceedingly fast access. these surfaces (or platters) and heads are permanently sealed inside a metal housing.

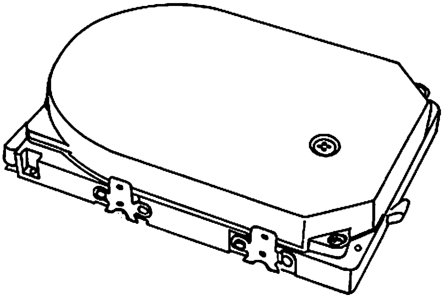


FIGURE 1-4. A FIXED DISK

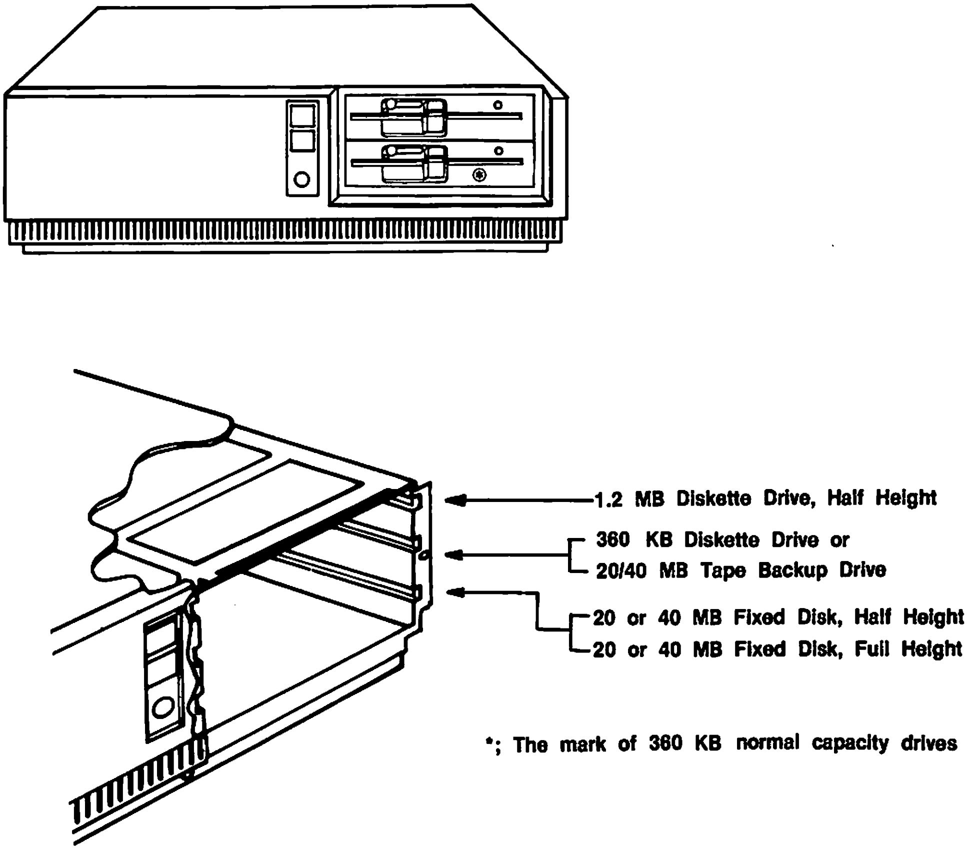

1.2 MB Diskette Drive, Half Height
360 KB Diskette Drive or
20/40 MB Tape Backup Drive
20 or 40 MB Fixed Disk, Half Height
20 or 40 MB Fixed Disk, Full Height
*; The mark of 360 KB normal capacity drives

FIGURE 1-5. DIFFERENT TYPES OF STORAGE

The combination of storage devices you choose is a function of

- Space : How much information do you want to record?
- Speed : How fast do you need to retrieve the information?
- Cost : How much can you afford to spend on storage devices?
- Usage : How do you intend to use the system now and in the future?

In terms of space, a standard double-density 5.25-inch diskette can contain approximately 250 book pages of text, and a high capacity diskette can hold about 833 book pages of text. A 20-megabyte fixed disk can hold about 14,000 book pages of text, and a 40-megabyte fixed disk can hold roughly 28,000 book pages of text.

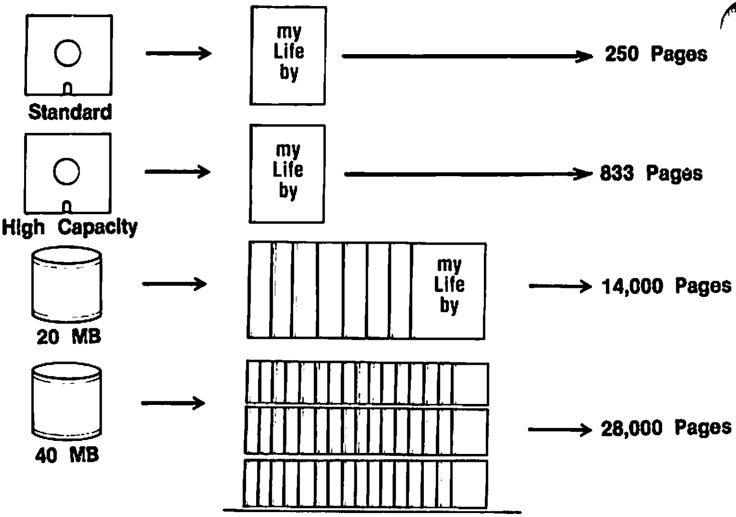


FIGURE 1-6. COMPARIS OF STORAGE CAPACITIES

A lot of information can be stored on a tape cassette, but file access (retrieving the information you want) can be quite slow if the information you want is stored at the end of the tape. when you want to access a specific piece of information, the computer searches from the beginning of the tape until it finds the target information. This kind of search is called a serial or sequential search.

Unlike the serial or sequential search of a tape device, diskette drives and fixed disks use what is called random access. When information is stored on a diskette, the location of the information is stored in an area of the diskette called a directory. This directory is like a table of contents. Instead of searching from the beginning of the diskette to the end, the computer goes directly to the location indicated by the directory. This is similar to listening to a particular selection on a record album. If you know where the selection begins, you can place the stereo stylus on the proper track without having to listen to the album from beginning to end.

Random-access devices retrieve information faster than serial devices. File access from a diskette is approximately 100 times faster than that of a cassette tape. Further, fixed disk access speed is more than 100 times faster than that of a diskette drive.

INPUT DEVICES

You must have some way of getting into your computer system. The standard way to do this is through the typewriter like part of your system called the keyboard. You can enter information into your personal computer by typing characters on the keyboard.

Another source of input is diskettes. Not only can you store information on and retrieve information from diskettes, but you can also purchase diskettes with prerecorded information. By typing commands on your keyboard, you can instruct the computer to read the information recorded on these diskettes and load it into the memory for processing.

OUTPUT DEVICES

The main output device for your computer is the monitor, a small television screen attached to your personal computer. When you type anything on your keyboard, the characters you type are displayed on the monitor. Your computer system displays messages and output on this same monitor.

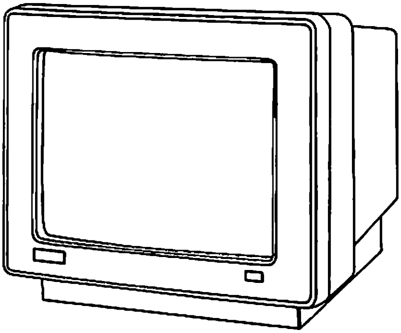


FIGURE 1-7. A MONITOR

You can also attach other output devices, such as printers, plotters, and modems, to your personal computer. Several types of printers are available. Some are very fast and can print all characters, including special graphic symbols, but do not produce letter-quality printout. Other printers create typewriter-quality printout, but are much slower.

Plotters are used to draw pictures, often in color. Modems are devices that make it possible for computers to communicate with one another over telephone lines.

OPERATING SYSTEM

How your computer system processes and retrieves data, stores information, displays or prints processed data, and communicates with other computer systems is determined by its operating system (OS). Without an operating system the computer is merely a collection of hardware parts. A part of your personal computer's Random Access Memory (RAM) is reserved to contain the oeprating system and the OS is loaded into RAM when the computer is turned on.

The operating system is part of what is called the system software. The OS defines how the hardware operates, including how the data will be processed and how and when the input/output (I/O) will be performed. In this sense, the oerating system manages all the system resources.

The operating system for your computer is MS-DOS, short for Microsoft Disk Operating System, a well-tested, highly reliable operating system. Refer to Section 2, Microsoft MS-DOS Operating System User's Guide, in this binder for complete information on MS-DOS and how it operates.

In addition to governing how the system's resources are to be managed, MS-DOS provides you with a set of instructions called commands that you can issue to your computer. Commands are individual requests that you make to the system to find out information or to perform a function. For example, you would use the DIR command to see a list of all the files you have stored on a diskette or fixed disk.

A program is a set of instructions to the computer to perform any of a variety of tasks.

Some programs are available from software manufacturers. These programs are known as software packages or applications programs. Some applications programs perform a single taks, such as word processing, accounting, inventory control, graphics, or mail list sorting. Other programs perform multiple tasks offering, for example, the ability to do word processing and to maintain mailing lists, or supplying both spreadsheets and graphics. All of these programs are designed to serve the largest possible market, but they may not be suited to your individual needs and those of your business.

You may want to have programs developed that are tailored to your specific needs. There are two ways this can be done. If you are not trained to write programs, you can design what you want your application program to do and then have a computer programmer write the program to make it perform that task. If you do know how to develop programs (or if you want to learn) then you can design and write your own programs, tailoring the functions and results to provide accurate, meaningful information for the daily routines of your business.

Earlier we mentioned that a computer makes no value judgment of the data it receives. Programs, however, can be instructed to discriminate among different types of data. For example, you may want a report of all customer bills that are outstanding after more than 30 days. To get this report, you could instruct the computer to ignore all invoice data that is less than 30 days old. If an invoice has been outstanding for only 10 days, its data will then be bypassed. In this sense, the computer can make a value judgment, but only if you tell it to do so.

FOR YOUR NOTES

Chapter Two

Computer System Components

COMPUTER SYSTEM COMPONENTS

The computer system is available in four different models or configurations. The configurations of computer systems differ in the same way that types of stereo systems differ. Just as one stereo might have an AM/FM receiver and a turntable and one might have an AM/FM receiver, a turntable, and a tape deck, configurations of computer systems differ in the number and style of storage devices (that is, diskette drives and fixed disk drives) used, and in the type of display (monochrome or color).

The basic components of each computer are always the same:

- the system unit, which contains all internal memory, storage devices, and various other parts
- a display monitor
- a keyboard

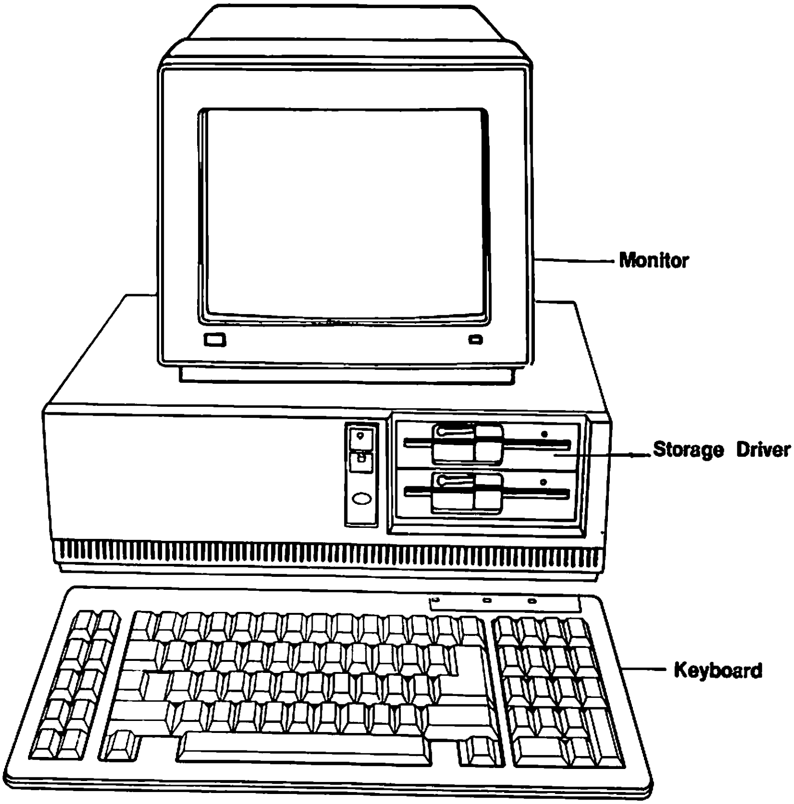


FIGURE 2-1. BASIC COMPONENTS OF A COMPUTER

THE DISPLAY MONITOR

Three types of display monitors are available for your computer. Refer to Chapter 4, Installing Your Computer System, and Chapter 6, Using Your Display Monitor, for more information regarding the installation and adjustment of these monitors.

The descriptions of monitors in this manual refer only to display monitors provided with your computer. If you have another type of monitor, please refer to the documentation provided by your dealer or distributor.

The first type of display available for your computer is a 12-inch measured diagonally) high-resolution monochrome monitor using the standard IBM 9-pin connection.

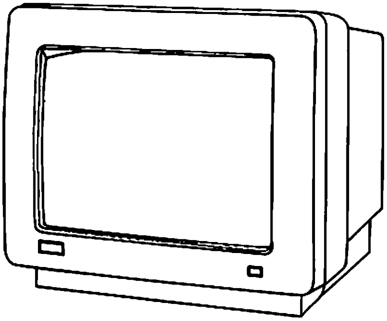


FIGURE 2-2. MONOCHROME MONITOR

The monochrome monitor displays either green or amber characters on a black background, depending on which type you ordered.

The second type of display monitor is an RGB (Red, Green, Blue) color display monitor—a 14-inch (diagonal) high-resolution monitor using a 9-pin connection. In normal text mode, it displays white characters on a black background, and it also can display color characters and graphics for applications that use these features.

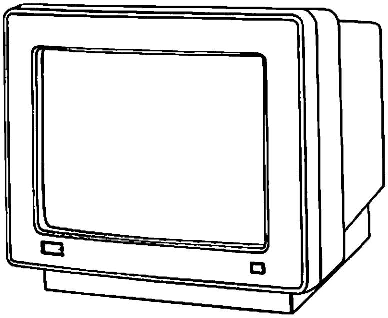


FIGURE 2-3. RGB COLOR MONITOR

The third type of display monitor is a 14-inch dual mode frequency color monitor. This monitor can be used in either text or graphics mode and provides enhanced color graphics using a higher resolution than the RGB color monitor. This monitor can be also be used as a normal color monitor.

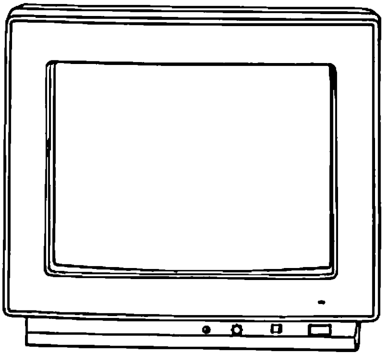


FIGURE 2-4. ENHANCED COLOR MONITOR

You can use practically any available display monitor, including your television set, with your computer, provided you have the correct hardware to support it. For example, if you start out with a monochrome monitor and later want to use a color monitor, the internal monochrome graphics display board must be replaced with a color display board. This is a simple exchange and you can order the color display board from your dealer or distributor. In addition, you will also need to adjust a jumper located on the system board. Refer to Chapter 11, Upgrading Your System, for information on how to change boards and adjust the jumper.

NOTE: The type of monitor you use must match the type of display board installed in your computer; that is, you must use a monochrome monitor with a monochrome display board. A variety of display boards are available, and many support different types of monitors. The major differences between monitors are;

- the type of display (monochrome or color)
- the type of data connection cable (9-pin or composite)

Your computer display boards use an IBM-compatible 9-pin connection and not a composite connection. If you have ordered a monitor with your system, the correct board has already been installed in your computer. If you change monitors, be sure you have the right type of display board for the monitor you have.

THE KEYBOARD

The keyboard provided with your computer contains a numeric keypad and 10 programable function keys in addition to the familiar alphanumeric character entry keys. The function keys are used in MS-DOS and most application programs to perform special or often-repeated functions. They save you time in a command; all you have to do is press a function key.

Refer to Chapter 4, Installing Your Computer System, and Chapter 7, Using Your Keyboard, for instructions on connecting and using the keyboard.

THE SYSTEM UNIT

Figure 2-5 shows a front view of your system unit with its cover removed, on which you can see the following:

- Power on and disk access indicators. These light up when power to the system unit is on and when the computer is accessing a disk drive.
- Reset button. This button allows you to restart your computer without turning it off and on again.
- Lock key. This is a safety feature that lets you lock the keyboard and reset button when you are away from your computer.

- Storage device area. The diskette drives, fixed disk, and tape backup are located here. If your system does not have one of the storage devices, that storage area is covered by a plate.

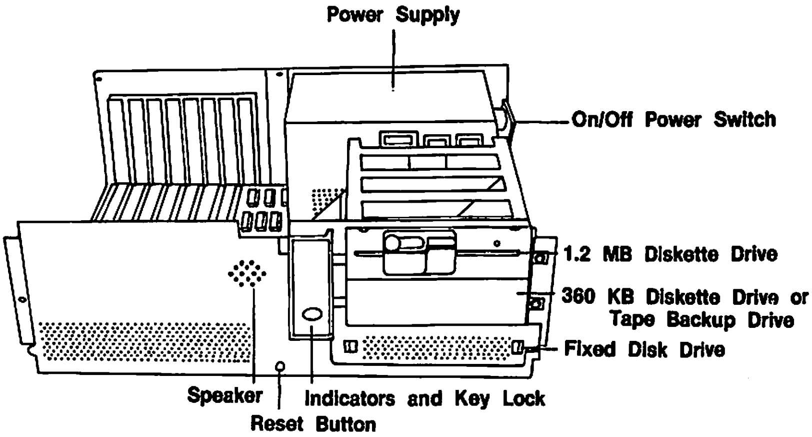


FIGURE 2-5. FRONT VIEW OF THE SYSTEM UNIT

Figure 2-6 is an illustration of the rear panel of your system unit, on which you can see the following:

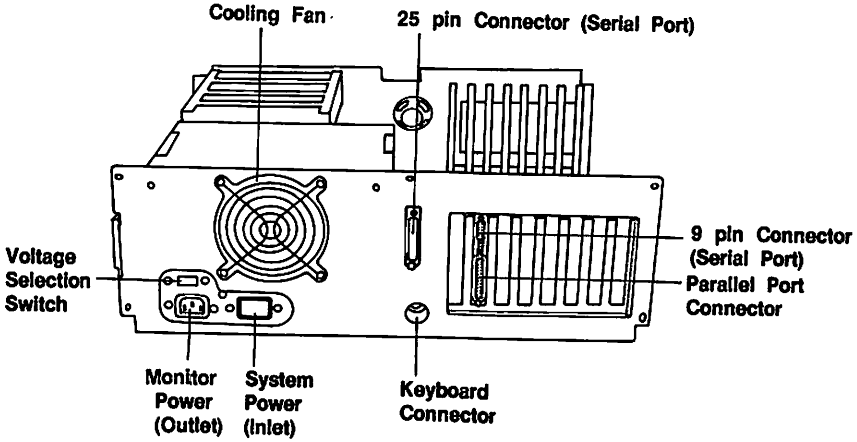


FIGURE 2-6. REAR PANEL OF THE SYSTEM UNIT

- On/Off power switch.
- Voltage selection switch—lets you select between 115 volts or 220/240 volts, depending on the wall receptacle you are using.
- Monitor power—The power cord for the display monitor plugs in here.
- System power—The power cord for the computer plugs in here.
- Cooling fan
- Keyboard connector
- 25-Pin serial port connector
- 9-Pin serial port connector
- Parallel port connector
- Expansion board slots—Some of these slots will contain the boards required for your system configuration, and some will be covered up. You can remove the covers when you add boards. See Chapter 11, Upgrading Your System, for instructions on adding and exchanging boards.

Figure 2-7 is a diagram of the inside of your system unit. A description of each of its parts follows.

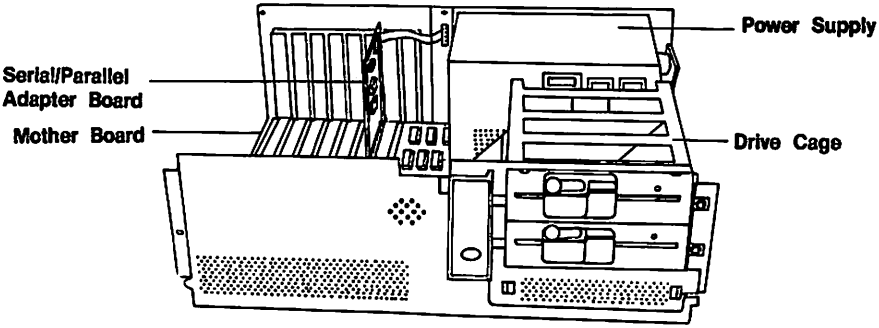


FIGURE 2-7. INSIDE OF THE SYSTEM UNIT

Before we go any further, a word of warning: The following description of each of the parts of your system unit gets a bit technical. Do Not Worry! This information is not essential to the installation and operation of your computer system. For those of you who like to know all the details, please read on. However, if you prefer, you can skip to Chapter 4, Installing Your Computer System, and go right to work. You can always come back to this part later on.

POWER SUPPLY

The power supply for your computer has a capacity of 200 watts. This power supply uses the following voltage ratings:

Norminal Output	Load Min.	Current (A) Max.
+ 5 Vdc	7.0	19.8
− 5 Vdc	0.0	0.3
+12 Vdc	2.5	7.3
−12 Vdc	0.0	0.3

STORAGE DEVICES

In the front right section of the system unit are your diskette drives, fixed disk drive, and tape backup. The specific devices your unit contains depends on your system configuration (model).

SYSTEM BOARD AND EXPANSION SLOTS

The system board is composed of eight IBM AT-compatible expansion slots. An expansion slot is a connector into which a system board (often referred to as a "card") is plugged. There are eight 62-pin connector slots, and Six 36-pin connector slots. IBM PC and PC-compatible boards that use eight bit data buses use the 62-pin connectors. IBM AT and AT-compatible boards that use 16 bit data buses use both the 62 and 36-pin connectors. Some of the expansion slots in your system are occupied by boards provided with your computer, and some you may want to fill yourself by adding your own specialized boards. These expansion slots are spaced 3/4-inch apart.

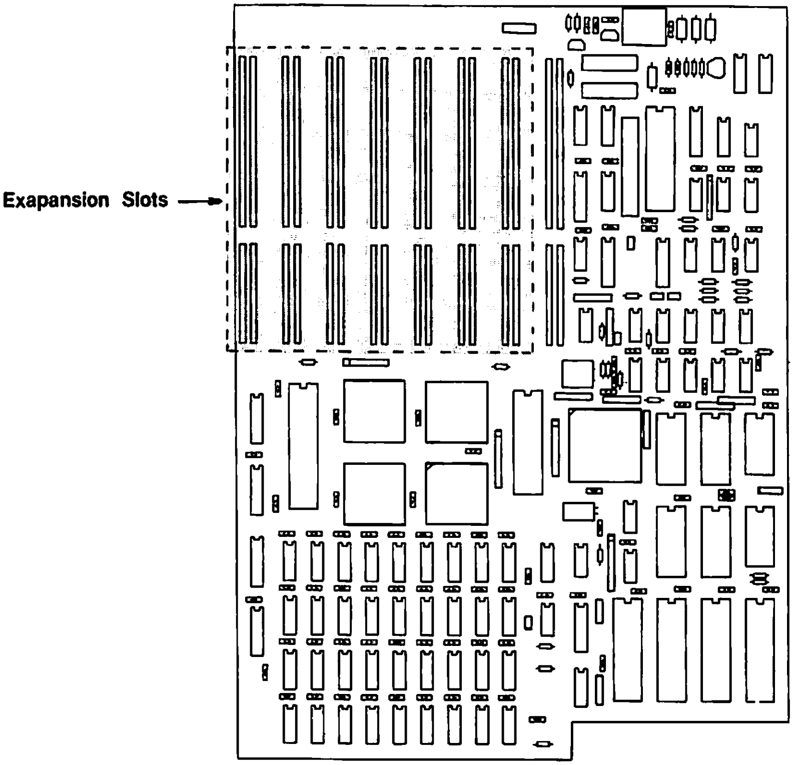


FIGURE 2-8. SYSTEM BOARD

CONTROLLER BOARDS

All computer models come with a serial/parallel adapter board. If you have ordered one of the monitors, the appropriate display controller board—for either monochrome or color—is installed. If you have ordered a fixed disk, the fixed disk controller board is installed. Each of these boards is described and depicted in the pages that follow.

The serial/parallel adapter board provides two serial ports and a parallel port.

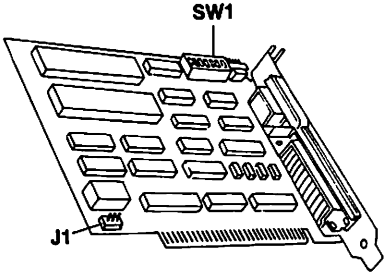


FIGURE 2-9. SERIAL/PARALLEL ADAPTER BOARD

The monochrome display board supports the IBM-compatible 9-pin D-type connector. You can use the monochrome display monitor or any IBM-type monochrome monitor.

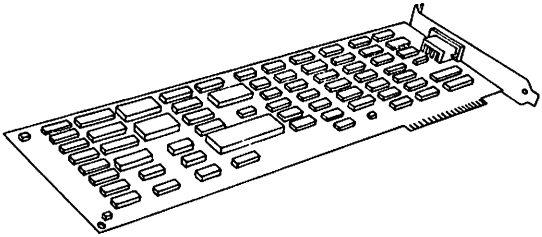


FIGURE 2-10. MONO GRAPHICS DISPLAY BOARD

If your system uses a color display monitor, a color display board will be installed instead of a monochrome display board. This board can also be ordered in addition to the monochrome display board if, for example, you plan to have a two-monitor system.

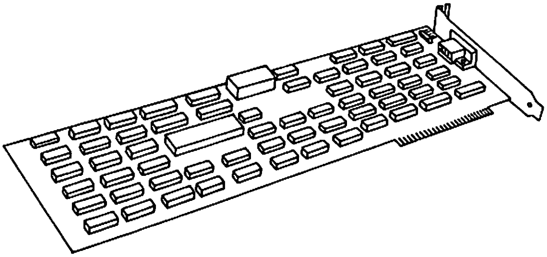


FIGURE 2-11. COLOR GRAPHICS DISPLAY BOARD

SERIAL/ PARALLEL ADAPTER

All computer models come with a serial/parallel adapter board. If you have ordered one of the monitors, the appropriate display controller board—for either monochrome or color—is installed. If you have ordered a fixed disk, the fixed disk controller board is installed. Each of these boards is described and depicted in the pages that follow.

The serial/parallel adapter board provides two serial ports and a parallel port.

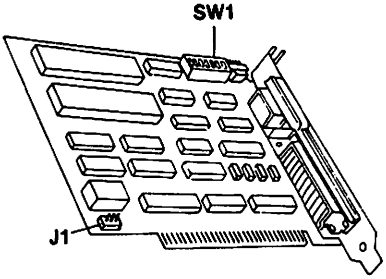


FIGURE 2-9. SERIAL/PARALLEL ADAPTER BOARD

FIXED DISK CONTROLLER BOARD

If you have the Model 3 or Model 4 computer a fixed disk controller board has also been installed in one of the expansion slots. This board manages access to your fixed disk: it is compatible with IBM's AT fixed disk controller board.

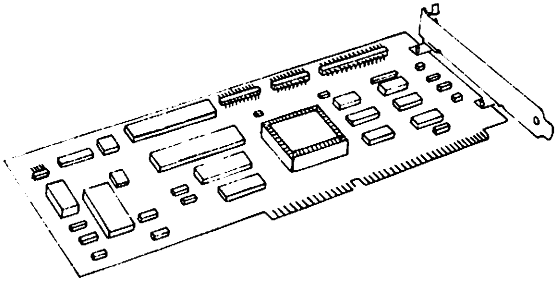


FIGURE 2-12. FIXED DISK CONTROLLER BOARD

The available expansion slots (those remaining after all the required system boards are plugged in) can be used for additional expansion boards. Any IBM PC, XT or AT-compatible board can be used, such as a memory expansion board or a board that controls a mouse. Many of these boards will be available from your local computer dealer.

NOTE: Your computer comes with a built-in diskette controller. Other systems, such as IBM, combine a fixed disk and diskette controller. If you are using or adding a board that has a diskette controller, you must disable one of the diskette controllers. See "Disabling the Diskette Controller" in Chapter 11 for instructions on disabling the built-in diskette controller that came with your computer.

If you have the Model 3 or Model 4 computer a fixed disk controller board has also been installed in one of the expansion slots. This board manages access to your fixed disk: it is compatible with IBM's AT fixed disk controller board.

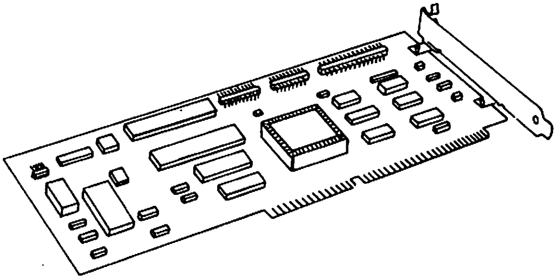


FIGURE 2-12. FIXED DISK CONTROLLER BOARD

The available expansion slots (those remaining after all the required system boards are plugged in) can be used for additional expansion boards. Any IBM PC, XT or AT-compatible board can be used, such as a memory expansion board or a board that controls a mouse. Many of these boards will be available from your local computer dealer.

NOTE: Your computer comes with a built-in diskette controller. Other systems, such as IBM, combine a fixed disk and diskette controller. If you are using or adding a board that has a diskette controller, you must disable one of the diskette controllers. See "Disabling the Diskette Controller" in Chapter 11 for instructions on disabling the built-in diskette controller that came with your computer.

FOR YOUR NOTES

Chapter Three

System Configurations

The following pages describe and illustrate the four standard configurations (models) of computers, so that you can become familiar with the hardware components of each model.

Until now, the term "component" has always referred to the three main parts of your computer system: the system unit, the keyboard, and the display monitor. The actual definition of "component" is "basic part or element." Component is also used to refer to;

- the parts of a specific piece of the computer system (for example, the components of the system unit include the storage devices, the power supply, and the system boards).

OR

- the parts of a system board—its chips and logic circuitry.

Throughout the rest of this manual, the term "component" will be used in any of these circumstances. In all cases the exact reference of the word will be indicated.

The monochrome monitor is used in the following diagrams for illustration; your monitor may be different.

MODEL 1- THE ONE-DISKETTE SYSTEM

Model 1 consists of the following:

- standard keyboard and display monitor
- system unit
  - one internal 5.25-inch 1.2 MB (formatted capacity) high capacity diskette drive
  - a 200-watt power supply
  - system board
  - serial/parallel adapter board
  - an optional display controller board (monochrome, color, or enhanced color)
  - six available expansion slots if the display controller board is included—seven available slots if no display controller board is included

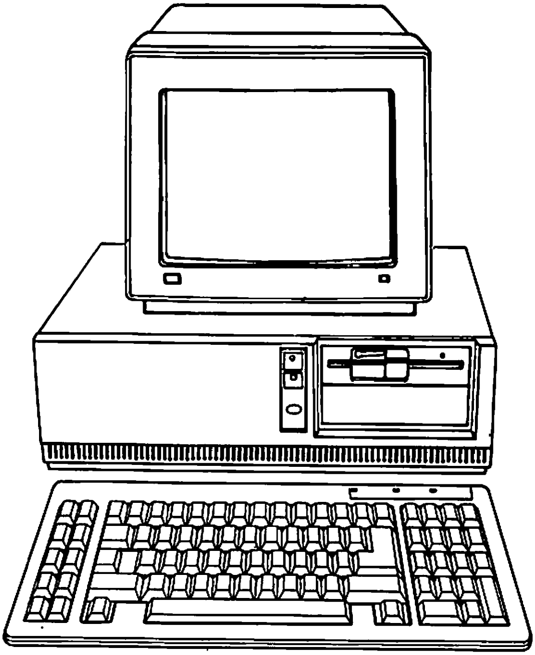


FIGURE 3-1. MODEL 1

MODEL 2– THE TWO-DISKETTE-DRIVE SYSTEM

Model 2 consists of the following:

- standard keyboard and display monitor
- system unit
  - one internal 5.25-inch 1.2 MB (formatted capacity) high capacity diskette drive
  - one internal 5.25-inch 360 KB (formatted capacity) diskette drive
  - a 200-watt power supply
  - system board
  - serial/parallel adpater board
  - an optional display controller board (monochrome, color, or enhanced color)
  - six available expansion slots if a display controller board is included—seven available slots if no display controller board is included

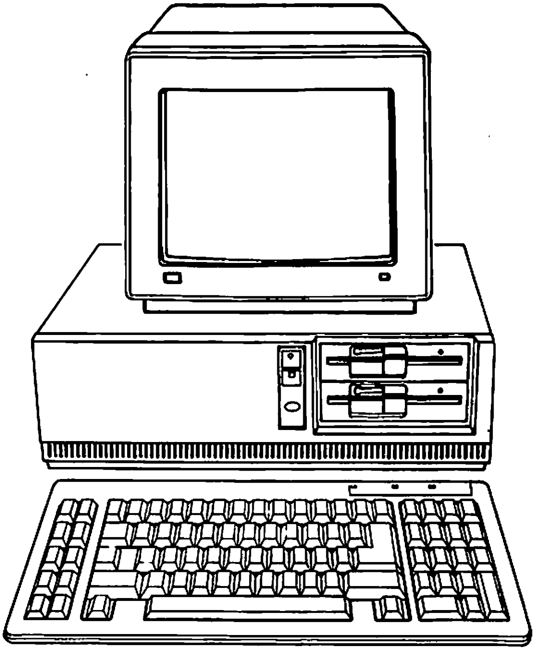


FIGURE 3-2. MODEL 2

MODEL 3- THE FIXED DISK SYSTEM

Model 3 consists of the following:

- standard keyboard and display monitor
- system unit
  - one internal 5.25-inch 1.2 MB (formatted capacity) high capacity diskette drive
  - one 20 MB or 40 MB fixed disk
  - a 200-watt power supply
  - system board
  - serial/parallel adapter board
  - an optional display controller board (monochrome, color, or enhanced color)
  - fixed disk controller board
  - five availabe expansion slots if a display controller board is included—six slots if no display controller board is included

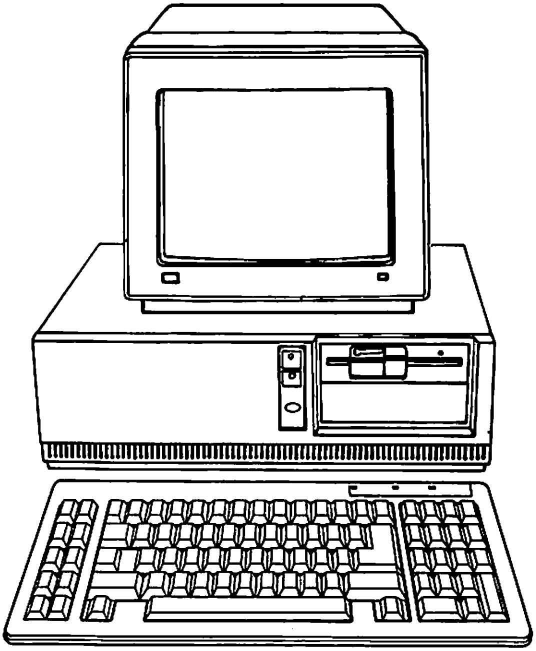


FIGURE 3-3. MODEL 3

MODEL 4- THE TAPE SYSTEM

Model 4 consists of the following:

- standard keyboard and display monitor
- system unit
  - one internal 5.25-inch 1.2 MB (formatted capacity) high capacity diskette drive
  - one 20 or 40-MB fixed disk drive
  - one 20 or 40-MB tape backup drive
  - a 200-watt power supply
  - system board
  - serial/parallel adapter board
  - an optional display controller board (monochrome, color, or enhanced color)
  - fixed disk controller board
  - five available expansion slots if a display controller board is included—six slots if no display controller board is included

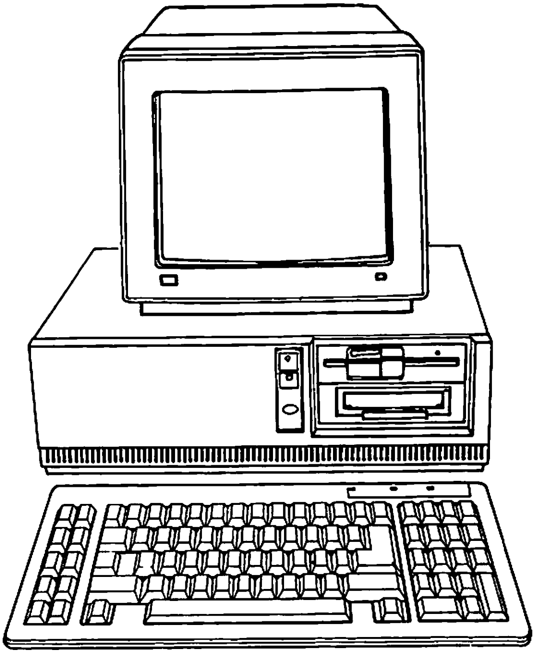


FIGURE 3-4. MODEL 4

FOR YOUR NOTES

Chapter Four

Installing Your Computer System

The following instructions explain how to assemble your computer and how to start it. although the instructions use the Model 2 configuration (two diskette drives) for illustration purposes, the instructions apply to all models.

BEFORE YOU BEGIN

Before you begin installing your computer, set the system unit on a clean, flat surface with enough room to allow you to turn the unit around to make conncetions and adjustments during installation. Next, collect a small, flat-bladed screwdriver and a clean cloth. You may not need these supplies, but it is good to have them handy. You can use the screwdriver to connect the display monitor cable securely to its connector port and the cloth to dust off the computer system once it is assembled.

ASSEMBLING AND CONNECTING YOUR COMPUTER SYSTEM

1. Remove the cardboard diskette drive head protector from the system unit diskette drives and keep it in a safe place. Use this protector if you transport your computer system.

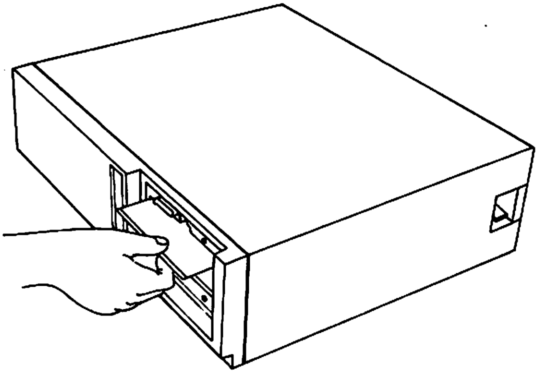


FIGURE 4-1. REMOVING THE CARDBOARD PROTECTOR

2. Connect the keyboard to the keyboard connector located on the rear panel of the system unit.

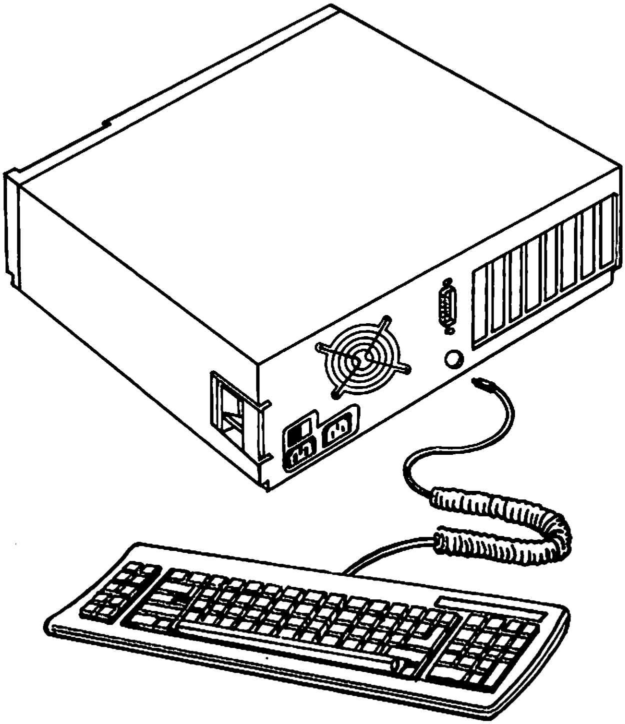


FIGURE 4-2. CONNECTING THE KEYBOARD

3. Be sure that the on/off power switch is in the off position. The power switch is located on the right side of the system unit toward the back.

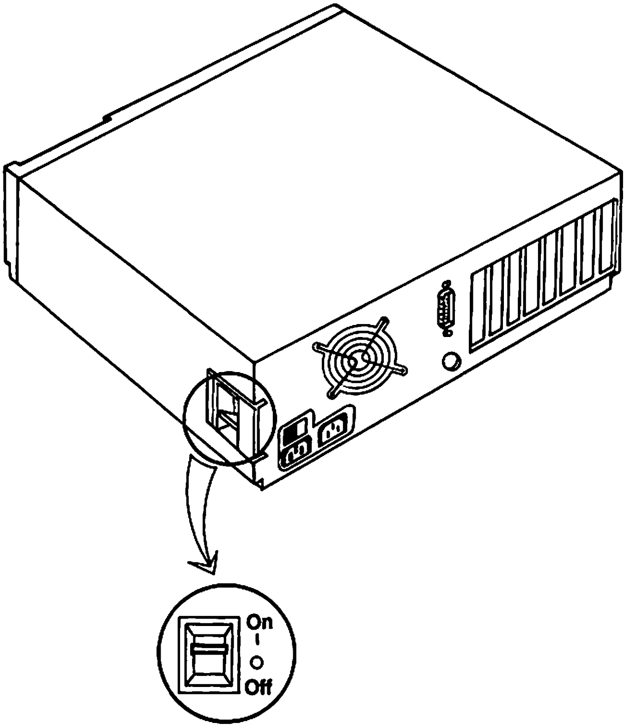


FIGURE 4-3. THE ON/OFF SWITCH

4. Gently set your display monitor on top of or to the side of the system unit. (Be sure to connect your keyboard first.)

5. Find the black, 9-pin connector cable that connects the display monitor to the display board in the system unit. Connect the free end of this cable into the 9-pin connector on the rear panel of your system unit. If you have monochrome or color monitor, this connector is labeled "video". If you have an enhanced color monitor, this connector is labeled "video outlet."

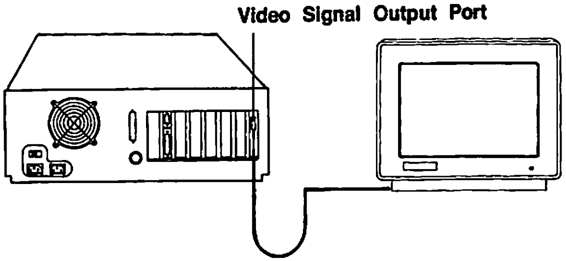


FIGURE 4-4. CONNECTING THE MONITOR TO THE DISPLAY BOARD

6. Plug the monitor power cord into the 3-pronged socket immediately below the voltage selection switch. If you have a monochrome or color monitor, this cable is gray. If you have an enhanced color monitor, this cable is black.

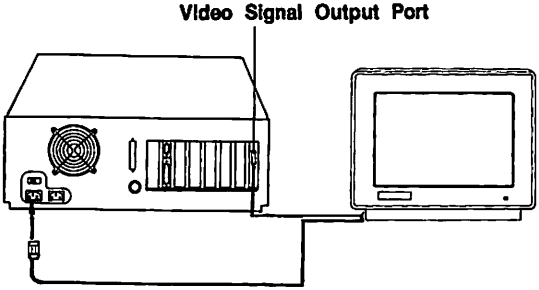


FIGURE 4-5. PLUGGING IN THE MONITOR POWER CORD

7. Connect the 3-pronged system power cord to the system power connector. This connector is just to the right of the monitor's power connector.

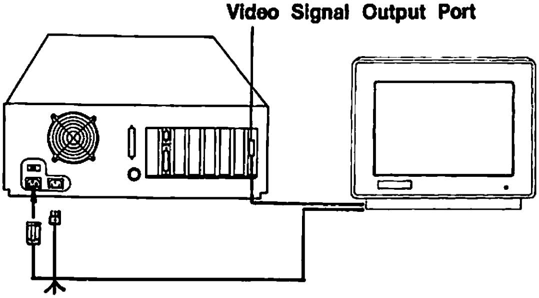


FIGURE 4-6. CONNECTING THE SYSTEM POWER CORD

8. Set the voltage selection switch to match the type of electrical wall outlet you will be using. This switch is located on the left side of the rear panel of the system unit. You can select either 115 volts or 220/240 volts. The setting must match the voltage of the AC wall outlet you are going to use. The standard for United States outlets is 115 volts. If you are using your computer in a different country, you may need to set this switch to the 220/240 setting.

9. Connect the other end of the power cord to an electrical wall outlet that is a properly grounded 115 AC or 220/240 AC receptacle.

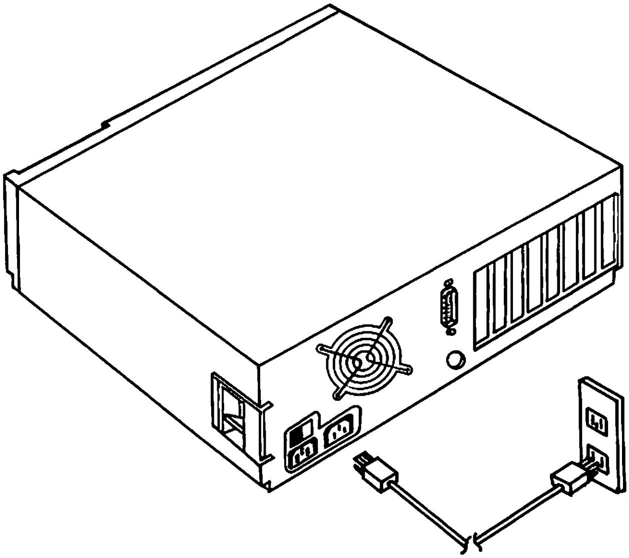


FIGURE 4-7. PLUGGING THE POWER CORD INTO THE WALL

STARTING YOUR COMPUTER SYSTEM

This completes the steps necessary to assemble your computer. You are now ready to start your computer system.

The following instructions tell you how to start up your computer system. These instructions describe a power-on or cold start.

Your system should be assembled, and all power cords should be plugged into the correct connectors. If you have not assembled and connected your system, see "Assembling and Connecting Your computer System" earlier in this chapter. If your computer does not have a fixed disk (Models 1 and 2 do not) you will need the diskette labeled "Operating System" that came with your computer.

1. Set the system unit power switch to on. This switch is located on the right side of the unit at the back.
2. Turn on the display monitor. If you have a monochrome or color monitor, do this by turning the knob labeled TURN ON located on the right side of the monitor. If you have an enhanced color monitor, press the power switch located at the bottom right of the monitor.

The light on the front of your display monitor should go on. If the light does not go on, see "If You have a Problem" later in this chapter.

After a few seconds, your computer runs a memory test and numbers representing increments of memory appear at the top left of your screen. When the memory test has successfully completed, you will hear a beep. If your system has a fixed disk (Models 3 and 4 do), the operating system is loaded onto the fixed disk at the factory, and the operating system is automatically accessed when the memory test has completed. You do not need to use the System Diskette when you start your computer.

3. If your system does not have a fixed disk, insert the Operating system diskette in drive A: with the label facing up and the notch to the left. Drive A: is the top drive if you have two diskette drives.

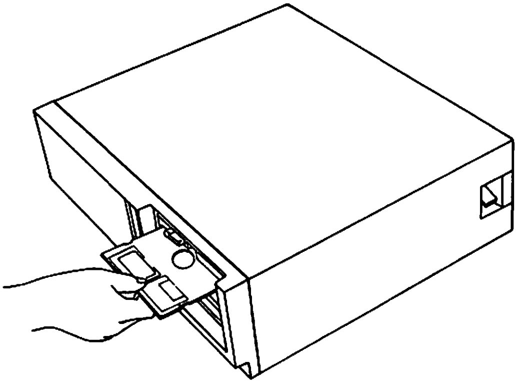
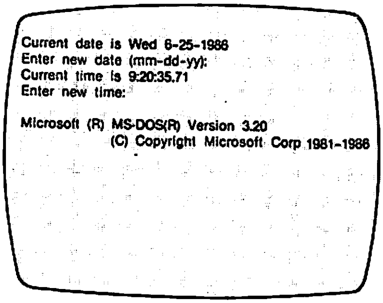


FIGURE 4-7. INSERTING A DISKETTE

You will hear a clicking sound as the system reads the diskette, and the indicator light on drive A: (or the disk indicator light if you have a fixed disk) will go on. This light indicates that the system is accessing the drive. After a few seconds the following information is displayed on your monitor:



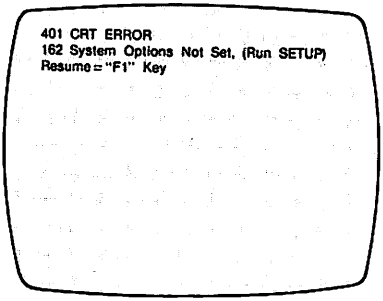
```
Current date is Wed 6-25-1986
Enter new date (mm-dd-yy):
Current time is 9:20:35.71
Enter new time:

Microsoft (R) MS-DOS(R) Version 3.20
              (C) Copyright Microsoft Corp 1981-1986
```

FIGURE 4-8. SIGN ON MESSAGE

IF YOU SEE AN ERROR MESSAGE

If the startup and memory test procedure is not successful, you will hear three short beeps and see an error message like the following:



```
401 CRT ERROR
162 System Options Not Set, (Run SETUP)
Resume="F1" Key
```

FIGURE 4-9. ERROR MESSAGE

After a few seconds, your computer runs a memory test and numbers representing increments of memory appear at the top left of your screen. When the memory test has successfully completed, you will hear a beep. If your system has a fixed disk (Models 3 and 4 do), the operating system is loaded onto the fixed disk at the factory, and the operating system is automatically accessed when the memory test has completed. You do not need to use the System Diskette when you start your computer.

3. If your system does not have a fixed disk, insert the Operating system diskette in drive A: with the label facing up and the notch to the left. Drive A: is the top drive if you have two diskette drives.

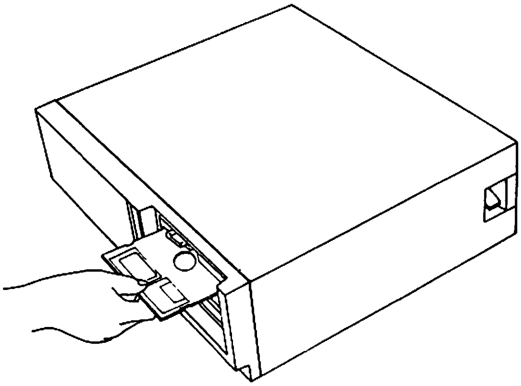
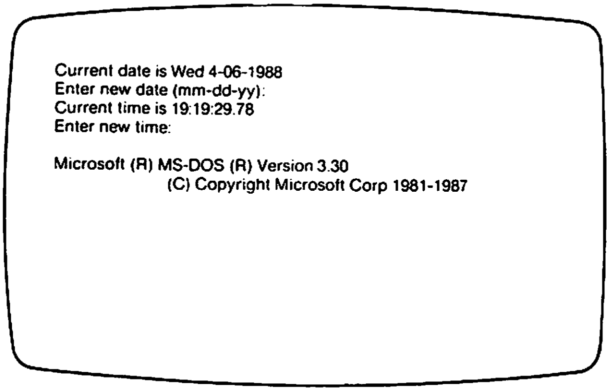


FIGURE 4-7. INSERTING A DISKETTE

You will hear a clicking sound as the system reads the diskette, and the indicator light on drive A: (or the disk indicator light if you have a fixed disk) will go on. This light indicates that the system is accessing the drive. After a few seconds the following information is displayed on your monitor:



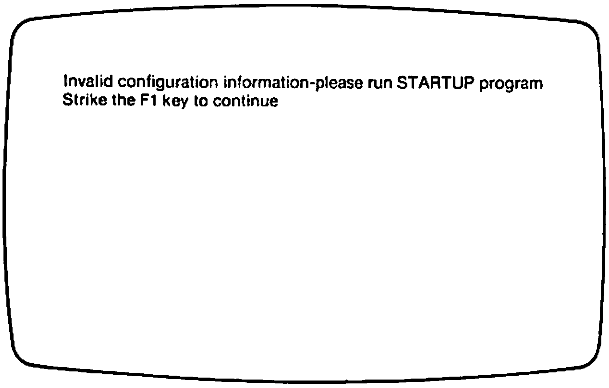
```
Current date is Wed 4-06-1988
Enter new date (mm-dd-yy):
Current time is 19:19:29.78
Enter new time:

Microsoft (R) MS-DOS (R) Version 3.30
               (C) Copyright Microsoft Corp 1981-1987
```

FIGURE 4-8. SIGN ON MESSAGE

IF YOU SEE AN ERROR MESSAGE

If the startup and memory test procedure is not successful, you will hear three short beeps and see an error message like the following:



```
Invalid configuration information-please run STARTUP program
Strike the F1 key to continue
```

FIGURE 4-9. ERROR MESSAGE

Follow the instructions that are given in the message on your screen. The above message tells you to run the SETUP program to set the options for your computer's configuration. To clear the message from your screen, press the F1 key. This lets you resume use of the computer. If you do not correct the error (such as running the SETUP program) you will get an error the next time you turn on the system. See Chapter 12 in this guide for information about using SETUP.

IF YOU DO NOT SEE THE MEMORY TEST

If the display monitor light does not come on or if the memory test is not displayed, turn the system off, and check that all cable connections are secure.

Next, with the computer still off, unplug it and check the outlet using a different electrical device. If the second device does not work, there is a problem with the outlet. Locate an outlet that works correctly with another electrical device and plug your computer's power cord into that outlet. If your system still does not work, contact your dealer or distributor for further assistance or service.

DATE AND TIME DISPLAY

Your computer keeps track of the current date and time and displays them as part of the logon message. The date and time are also stored with all files you create or change, so that you can find out when a file was last updated. This information may be helpful if you have many files on your system and you cannot remember when you last changed the information in those files.

Because of time zone differences, the date and time displayed may be incorrect. If this is the case and you want your files to reflect the correct date and time, you must reset them.

You can set the date and time in one of two ways:

- from the logon message display

- from the SETUP program

If you set the date and time from the logon message dispaly, the computer will only keep track of them while your computer is running. Each time you start up your computer, they will be reset to the date and time you currently see displayed.

To reset the date and time permanently, use the SETUP program. Once you have done this, you will not have to set them each time you start your computer. You will have to set the time and date again only if you move to a different time zone or if you change to daylight savings and back. See Chapter 12 for information about using the SETUP program.

Whether you set the date and time from the logon display or the SETUP program, the formats in which you enter them are the same. The format for entering a new date is

mm-dd-yy OR mm/dd/yy

Replace the letters shown above with numbers as follows:

mm is a one- or two-digit number from 1 to 12 designating the month.

dd is a one- or two-digit number from 1 to 31 designating the day of the month.

yy is a two-digit number from 80 to 99 (the system assumes the 19) or a four—digit number from 1980 to 2099 designating the year.

As long as you enter a date that fits into this format, the system will accept it as the new date. If you enter an invalid date or use the wrong format, the system prompts you to enter the date again. Here are some examples of acceptable dates:

7-4-86
7/4/86
07-04-86
7/04/86
7-4-1986
07/04/1986

Here are some examples of unacceptable dates:

070486	missing dashes or slashes
07 04 86	uses spaces instead of dashes or slashes
JUL-04-86	uses letters instead of numbers
13/01/86	month greater than 12
07/33/86	day greater than 31

You enter time in 24-hour (military) format. This format is expressed as

hh:mm

where hh is a one-or two-digit number from 0 to 23 designating the hour and mm a one-or two-digit number from 0 to 59 designating the minutes.

If you enter an invalid time or your format is incorrect, you are prompted to enter the time again. The following are some examples of acceptable times:

9:30
09:30
14:16

The following are examples of unacceptable times:

930	missing colon
9 30	uses a space instead of colon
30:15	hour greater than 23

To accept the current date that is displayed on your screen, press the Enter key following the "Enter new date:" prompt. To accept the time that is displayed on your screen, press Enter key following the "Enter new time:" prompt.

PROMPT THE SYSTEM

The system prompt tells you that the system is ready to accept a command or to perform another function such as running a program. If you are using MS-DOS, the system prompt is a letter followed by a greater-than symbol such as A>. The letter indicates what drive the computer will look on the access information or process requests. Basically, the system prompt means that the system is waiting for you to tell it what to do next.

Now that your computer system is running, you can begin your work. It is recommended that you read through the rest of this manual to learn the basics of your system and to pick up some helpful hints. Refer to the Section 2, MS-DOS Users Guide, for information on the system commands, and refer to the documentation provided with any applications you are using for help on running your software programs.

TURNING THE POWER OFF

Before you turn your computer off, there are several steps you should follow to avoid damage to your diskettes or fixed disk. See "Turning Your System Off" in Chapter 5 for instructions.

FOR YOUR NOTES

Chapter Five

Using Your Computer System

THE DRIVE IDENTIFIERS

This chapter gives you information about accessing the diskette and fixed disk drives on your computer, as well as how to start, restart, and turn off your computer.

The various components of your computer system have names that you use to refer to them, such as "system unit", "display monitor", and "keyboard". Similarly, the computer system itself must also have a way of referring to its parts. Since it always has a keyboard and display monitor, the system knows how to reference these parts.

Because the number and type of diskette and fixed disk drives in your system unit may vary, there is a special set of names called drive identifiers that your computer system uses to designate these components. Drive identifiers let your computer system differentiate one storage device from another.

Below are the drive identifiers for the storage devices in each computer system configuration:

Model 1 One-Diskette Drive System
- Diskette drive is called A: or B:. This lets you simulate a two-diskette drive system.

Model 2 Two-Diskette Drive System
- Top diskette drive is called A:.
- Bottom diskette drive is called B:.

Model 3 Fixed Disk Drive System
- Diskette drive is called A: or B:. This lets you simulate a two-diskette drive system.
- Fixed disk is called C:.

Model 4 The Tape Backup Drive System
- Diskette drive is called A: or B:. This lets you simulate a two-diskette drive system.
- Fixed disk is called C:

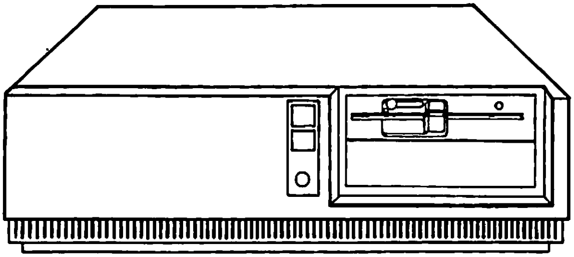


FIGURE 5-1. MODEL 1 SYSTEM UNIT

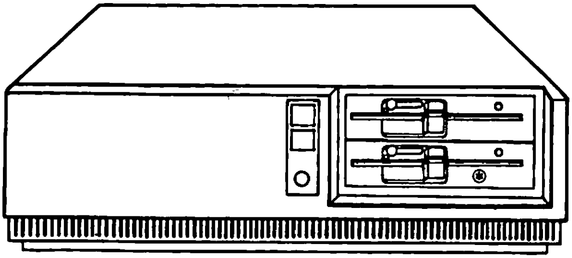


FIGURE 5-2. MODEL 2 SYSTEM UNIT

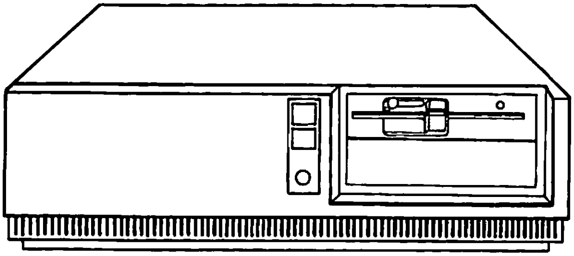


FIGURE 5-3. MODEL 3 SYSTEM UNIT

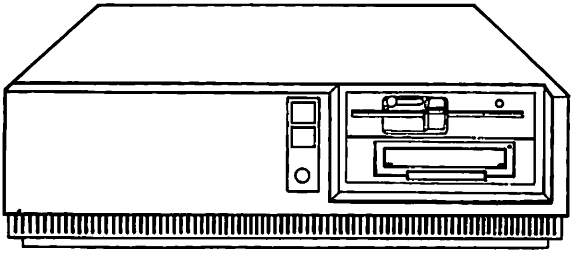


FIGURE 5-4. MODEL 4 SYSTEM UNIT

THE DEFAULT DRIVE

These identifiers will always be this way. During the installation procedure in Chapter 4, you inserted a system diskette in a diskette drive to start up your computer system. If you have a system with two diskette drives, you used the top drive; if you have a system with a single diskette drive, you used its only diskette drive. In either case, this drive is known as drive A:. Once your computer system was running, the display monitor showed a system prompt that looked like this:

```
A>
```

This A> indicates that you are currently using drive A:. This drive is known as your default drive. The default drive is the drive your computer system uses automatically (to read from or write to) unless you tell it to use a different one. If you want to have drive B: as your default drive, then you need to request this change with the following command:

```
A>B: <Enter>
```

(Type in the letter of the new default drive, B, followed by a colon, and press the Enter key.)

The system will respond with

```
B>
```

This new system prompt, B>, shows that drive B: is now your default drive. The system automatically uses this drive until you specify a different one.

If your computer system has two diskette drives, you will always see the A> system prompt when you start your computer. At any time, you can reference and use the bottom diskette drive—B:. These are your only two storage device drives.

If your computer system has a fixed disk, it is recommended that you store the system diskettes in a cool, dry, safe place for backup. Normally, the computer will access the operating system on the fixed disk, and you will always see a C> system prompt when you start up. When you have a fixed disk system, the one diskette drive in the system is both A: and B:.

Having one drive that is labeled both A: and B: allows you to work with two diskettes at once, even though you do not have two physical drives in your system. The diskette drive that you referred to last is the one the operating system will think it is using. Whenever you refer to the other one, the system will prompt you to insert a new diskette.

For example, if you last used drive A: and you want to see a list of the files on drive B:, you would type the following command:

```
A>DIR B: <Enter>
```

```
Insert diskette for drive B: and strike any key
when ready.
```

This prompt instructs you to remove the current diskette from the diskette drive and insert a new one in its place.

Refer to Section 2, MS-DOS User's Guide, in this binder for more information on drive identifiers and default drives.

STARTING AND RESETTING YOUR COMPUTER SYSTEM

This section uses a two-diskette drive system (Model 2) as an example. Systems that do not have a fixed disk must be started with a system diskette. Systems that have a fixed disk start from the fixed disk. If you have a computer system with a fixed disk, ignore the references to the system diskette in this section.

Each time you start or reset your computer system, the computer will load the operating system, MS-DOS, from diskette (or from the fixed disk) into memory. This must happen before you can work on the computer system.

STARTING A SYSTEM WITH A FIXED DISK

Whenever you start or reset a computer system with a fixed disk, the system will first access the diskette drive looking for a system diskette. Since there will not be a diskette in this drive, the system will then access the fixed disk to obtain the operating system. After a few moments, the standard sign on messages will be displayed.

RESETTING YOUR COMPUTER SYSTEM

MS-DOS is loaded into your computer system with either a power-on (cold start) or a reset. See "Starting Your Computer System" in Chapter 4 for information on starting the system with a power-on.

A reset, also known as a warm start, allows you to restart the system without turning the computer off and back on again. There are two ways to reset the system:

- by pressing the reset button
- by pressing certain keys on your keyboard

To reset using the reset button, press the reset button located on the lower front of the system unit just under the lock key. Use the reset button carefully—pressing this button resets the whole system and you will lose whatever you were doing.

NOTE: If you lock the system using the key lock, the keyboard and the reset button are locked. This safety feature prevents an accidental reset of the system when you are away from your computer and do not want to turn the power OFF. If you have locked the system using the key lock, you must unlock it before you can use the keyboard or the reset button.

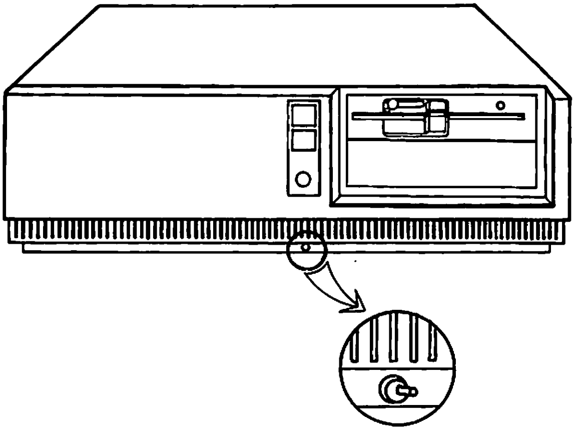


FIGURE 5-5. THE RESET BUTTON

To use the keyboard for a reset, press the **Ctrl**, **Alt**, and **Del** keys simultaneously. This also causes you to lose whatever you were doing.

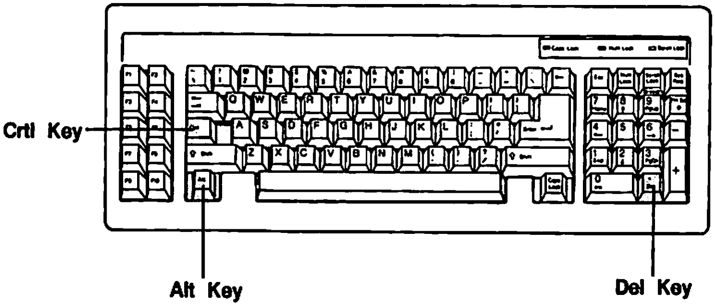


FIGURE 5-6. THE CTRL, ALT, AND DEL KEYS

In both cases, after a few seconds a memory test is displayed at the top left of the screen. When the memory test has successfully completed, you will hear a short beep. (If an error message is displayed, press F1 to resume, and correct the error). When the memory test has successfully completed, insert the System Diskette to access the operating system. You will hear a clicking sound as the operating system is loaded. If you have a fixed disk, the operating system is automatically loaded from it.

After a few moments, the familiar sign on message is displayed on your monitor (see Figure 4-8). You can then continue working with your system.

TURNING YOUR SYSTEM OFF

IMPORTANT

Read and follow these instructions for diskette and fixed disk protection.

NOTE: The following instructions assume that your monitor's power cord is connected to the back of the system unit, as described in Chapter 4. If this is the case, the monitor will power off when you turn off the system unit, and will power on when you turn the system unit on. If your monitor is not plugged into the computer, turn off its power before you turn off the system unit.

ONE-OR TWO-DISKETTE-DRIVE SYSTEMS (MODELS 1 OR 2)

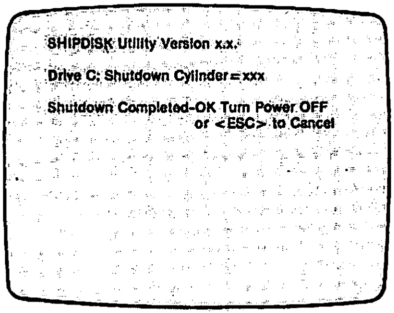
1. Remove any diskette(s) that may be in the diskette drive(s).
2. Turn the On/Off power switch to the off position.

FIXED DISK DRIVE SYSTEMS (MODEL 3) AND TAPE BACKUP DRIVE SYSTEM (MODEL 4)

1. Remove any diskette(s) that may be in the diskette drive.
   Remove any tapes from the tape backup unit. (Model 4)
2. Execute the SHIPDISK utility program. This utility positions the fixed disk heads over the inner tracks of the fixed disk, where no data are written, to avoid damaging the data on the disk. To use this program, type SHIPDISK following the system prompt, as follows:

```
C>SHIPDISK<Enter>
```

After you do this, the messages shown in figure 5-7 are displayed.



```
SHIPDISK Utility Version x.x.

Drive C; Shutdown Cylinder=xxx

Shutdown Completed-OK Turn Power OFF
                      or <ESC> to Cancel
```

FIGURE 5-7. SHIPDISK MESSAGES

xxx=615— for 20 MB fixed disk
????—for 40 MB fixed disk

3. Turn the on/off power switch to the off position.

FOR YOUR NOTES

Chapter Six

Using Your Display Monitor

This chapter tells you about each of the three monitors that you can order for your computer model. The three kinds of monitors are:

- 12-inch monochrome monitor

- 14-inch color monitor

- 14-inch enhanced color monitor

Each monitor has a power light indicator on the front. This light is on when the power to the monitor is on. The adjustment controls for these monitors are explained below. For information about connecting your monitor to the computer, see "Assembling and Connecting Your Computer System" in Chapter 4.

CAUTION: Never remove the back cover of any monitor since doing so may expose you to very high voltage and other hazards. If you cannot get the monitor to operate properly by adjusting the controls as explained below, consult your dealer or distributor for assistance.

USING YOUR MONOCHROME OR COLOR DISPLAY MONITOR

Figures 6-1 and 6-2 show the monochrome display monitor and the controls available to you. Two controls are located on the right side of the monitor, and they allow you to adjust the display of your monitor to your liking. Several other controls that allow you to adjust the monitor are located on the back of the monitor. The adjustment controls for the 14-inch color monitor are identical to those of the monochrome monitor. If you have a color monitor, use these illustrations as a guide to locate its adjustment controls.

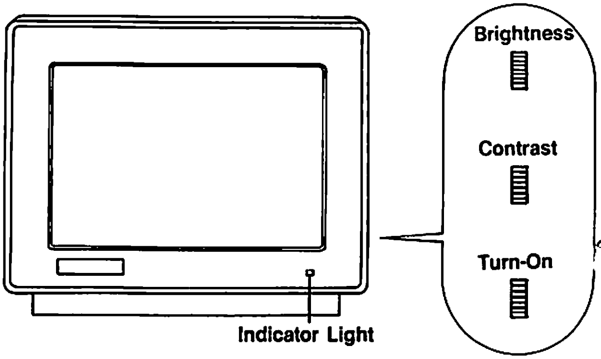


FIGURE 6-1. CONTROLS ON THE FRONT OF THE MONITOR

Use the **BRIGHTNESS** knob to adjust the brightness of the monitor. Turning this knob makes the picture brighter or dimmer, depending on the direction in which you turn it.

Adjust this knob after you have adjusted the contrast knob.

The **CONT** (contrast) knob controls the contrast between the characters on the screen and the background. Adjust this control based on the brightness of your room to obtain a picture that is easy to see.

Use the **TURN ON** knob to turn the power to the display monitor on and off.

Figure 6-2 is an illustration of the back panel of the monochrome display monitor and its controls.

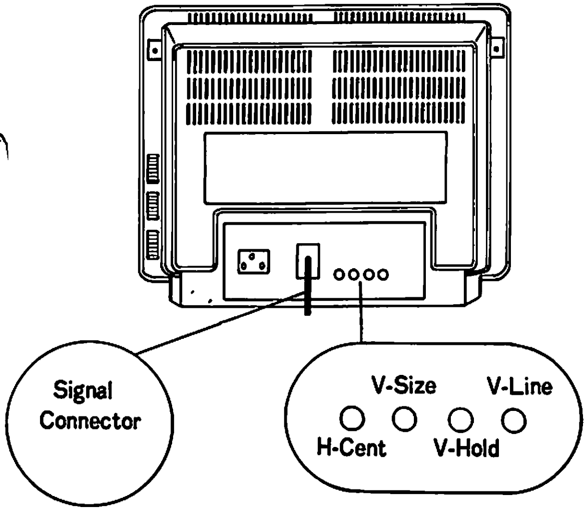


FIGURE 6-2. CONTROLS ON THE BACK OF THE MONITOR

The 3-pronged slot labeled Power is where the AC power cord plugs into the monitor. The other end of the cord plugs into the back of the computer or into a wall receptacle.

Video is the connection point for the cable that transmits data from the computer to your screen.

The five controls explained below fine-tune your monitor display. To adjust any of these controls, carefully insert a small flat-bladed screwdriver into the proper hole until you feel it seat into position. Turn it gently and gradually in either direction to adjust.

H. POSITION (horizontal position) lets you adjust the screen image left and right.

V. SIZE (vertical size) lets you adjust the vertical height of the screen image.

V. LIN (vertical linearity) lets you adjust characters that are skewed on the screen.

V. HOLD (vertical hold) lets you adjust a picture that breaks at the top or bottom or that rolls vertically across your screen.

H. HOLD (horizontal hold) lets you adjust a picture that breaks at the left or right or that rolls horizontally across your screen.

USING YOUR ENHANCED COLOR MONITOR

Figure 6-3 shows the front panel of the enhanced color display monitor. There are four controls.

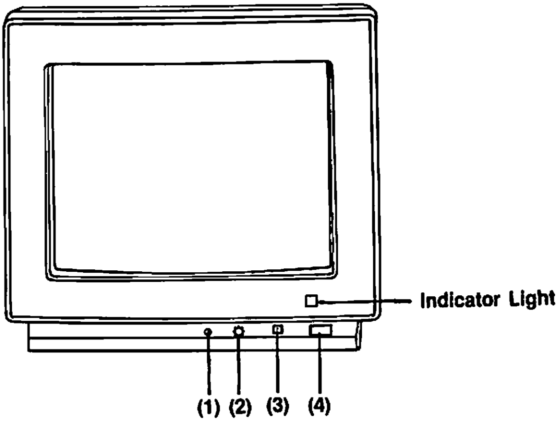


FIGURE 6-3. THE FRONT OF THE ENHANCED COLOR MONITOR

The contrast knob (1) adjusts the contrast between the characters or graphics on your screen and the background. Adjust this control based on the brightness of your room to get a picture that is easy to see.

The brightness knob (2) adjusts the brightness of your screen. Turning this control makes the screen brighter or dimmer, depending on the direction in which you turn it.

Text mode (3) lets you switch between text mode and graphics mode.

The Power control (4) turns the power to your monitor On and Off.

FOR YOUR NOTES

Chapter Seven

Using Your Keyboard

This chapter defines the parts of your keyboard and the uses of the special keys. Within a specific application, such as word processing or accounting, many of the keys serve purposes that are specific to the application and different than the ones defined here. Be sure to read your application manuals carefully for these changes.

ADJUSTING YOUR KEYBOARD

You can adjust the keyboard on your computer so that it tilts up slightly at the top. To do this, locate the small black legs on the underside of the keyboard. These can be pulled out from the keyboard into a standing position and a tilted keyboard. Experiment with the legs to adjust the keyboard for your best typing comfort.

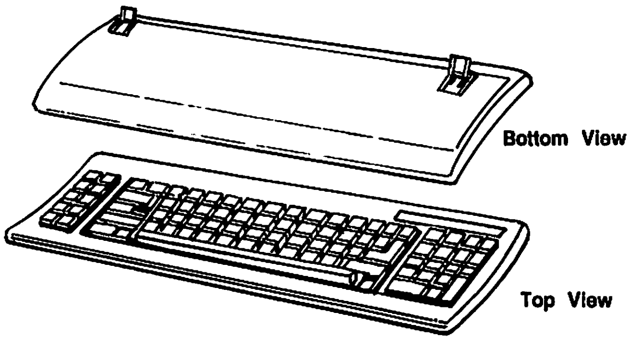


FIGURE 7-1. ADJUSTING THE TILT OF THE KEYBOARD

USING YOUR KEYBOARD

You communicate with your computer using a keyboard that resembles a typewriter keyboard except that it contains more keys. The standard computer keyboard has three sections through which you can enter data: a typewriter area for entering alphanumeric characters (letters and numbers), a numeric keypad for entering numbers and moving the cursor, and a function key area.

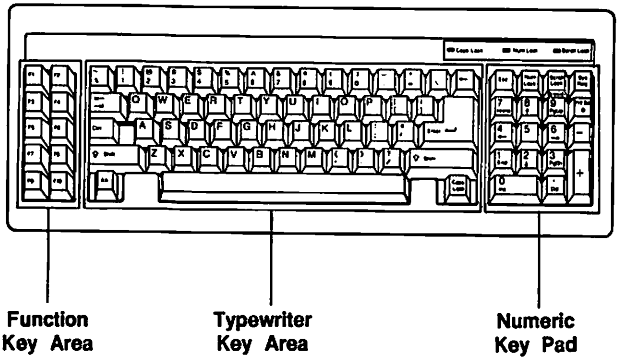


FIGURE 7-2. AREAS OF THE KEYBOARD

SPECIAL KEYS IN THE TYPEWRITER AREA

You can enter alphabetic characters and numbers through the typewriter section of the keyboard just as you would if you were typing on a standard typewriter. You will readily recognize most of the keys. The following text describes special keys with which you may not be familiar. Refer to Figure 7-3 as you read about the various keys.

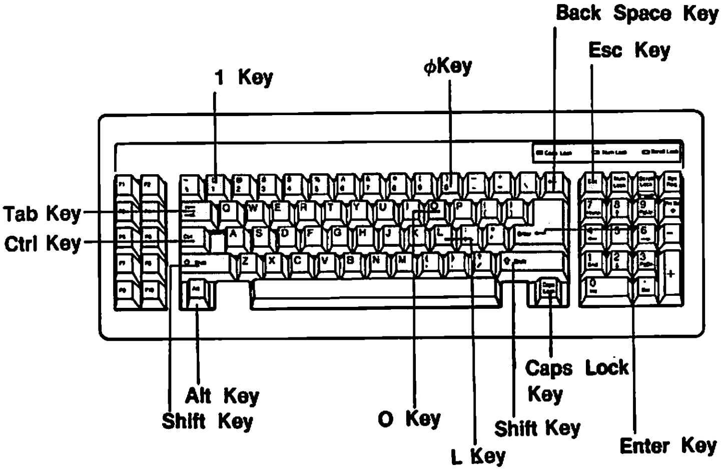


FIGURE 7-3. SPECIAL KEYS

The **Shift** keys are located on the left and right side of the keyboard and are labeled with a large upward arrow. Press a **Shift** key to type uppercase (capital) letters and the special symbols shown on the top part of any key, including those on the numeric keypad.

The **Caps Lock** key causes the letters A through Z to lock in uppercase mode. Numbers are displayed normally, and keys that have two symbols produce the lower symbol. To type lower case letters when the **Caps Lock** key is activated, press the **Shift** key.

When **Caps Lock** is on, the **Caps Lock** indicator light at the top right of the keyboard is on. To resume typing the characters A through Z in lowercase mode, press **Caps Lock** a second time. When you do this, the **Caps Lock** indicator light will go off.

The **Backspace** key moves the cursor one character to the left, as it does on most typewriters. As it passes over a character, that character is erased.

The **Enter** key tells your computer that the current line of text is complete and is ready to be processed. Within some programming languages or applications, the **Enter** key has a special definition.

In word processing programs for example, pressing the Enter key causes a "hard" carriage that moves the cursor to the beginning of the next line. A hard carriage return remains in place even if your word processor reformats text. If you do not issue a hard carriage return, your word processor performs a "wrap-around" that automatically carries the line of text to the beginning of a new line when it reaches the margin. Wrap-around eliminates the need to enter a carriage return manually.

Carriage returns created by wrap-around are referred to as "soft" carriage returns. The word processor deletes any unnecessary soft carriage returns when text is reformatted. If you want to begin a new line at a specific place (to start a new paragraph, for example), press the **Enter** key to issue a hard carriage return.

The space bar moves the cursor one space to the right. If the cursor moves over a character, that character is replaced with a blank.

The **Alt** (Alternate) key is used in combination with other keys to perform a command or function. For example, pressing the **Ctrl**, **Alt**, and **Del** keys results in a system reset.

THE CURSOR CONTROL AND NUMBERIC KEYPAD KEYS

The **Ctrl** (Control) key is used in combination with specific characters or numbers to produce a function defined by the operating system, application program, or software package. This section explains operating system functions that use the **Ctrl** key, such as **Ctrl-Alt-Del** for reset and **Ctrl-PrtSc** for the printer echo toggle. Other software may define other functions that use the **Ctrl** key. For information on these, refer to your application program manuals.

The **Tab** key moves the cursor to the next tab stop. **Tab** stops usually have a default setting in an application, but you can also reset them. To set your own tab stops, refer to your application program manuals.

The one (1) key must be used to enter a numeric one (1). A lowercase L (l cannot be used for this function.

The numeric **0** key is used to enter a zero, and the **0** key is used to enter the character **O.** These keys cannot be interchanged; they serve completely different purposes.

The numeric keypad is set up like a calculator to let you enter numbers more quickly. It also has other keys that perform special functions. These special keys are described on the following pages.

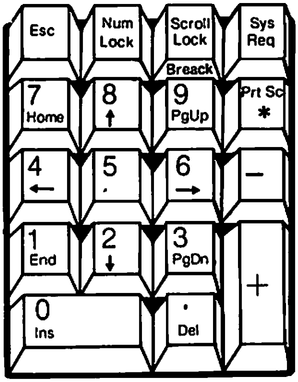


FIGURE 7-4. THE NUMERIC KEYPAD

Press the **Num Lock** (Number Lock) key to place the keypad in number mode rather than cursor-control mode. Press it again to return to cursor-control mode. In cursor-control mode, pressing the 2, 4, 6 and 8 keys moves the cursor in the direction of the arrow on the key. In number mode, pressing these keys enters the actual number 2, 4, 6, or 8. The **Num Lock** indicator light at the top right of the keyboard is on when number mode is locked on.

Notice that the keypad default mode is cursor-control mode. Unless you press the **Num Lock** key, the 2, 4, 6, or 8 keys will move the cursor instead of entering a number.

The **Num Lock** key also temporarily suspends system operation. If a large amount of output is scrolling across your screen too quickly for you to read, press the **Ctrl** and **Num Lock** keys simultaneously to stop scrolling. Press any other key to resume scrolling.

The **Esc** (Escape) key function is defined by the operating system of application program. At the operating system level, the **Esc** key cancels the current line of input and moves the cursor to the beginning of the next line. A backslash (\) is displayed at the end of the canceled line. Refer to your application documentation for a description of the use of this key within different applications.

Pressing the Scroll **Lock/Break** and **Ctrl** keys at the same time stops program execution and displays the system prompt. Refer to your application program manuals for Scroll **Lock/Break** key functions that are specific to your programs.

The **Home** key returns the cursor to the top left corner of the display screen. In some applications, the **Home** key can perform a different function. Refer to your application manuals for more information about what this key does in specific programs.

The **Pg Up** (Page Up) and **Pg Dn** (Page Down) keys let you view the previous "page" or next "page" of text. The number of lines to a page are application specific. Refer to your application program manuals for more information on how to use these keys in specific programs.

The cursor-control keys are the four arrow keys on the numeric keypad. These four keys move the cursor up one line, down one line, to the left one character, or to the right one character, as indicated by the arrows. Their location can be remembered for touch typing, as they form a diamond pattern.

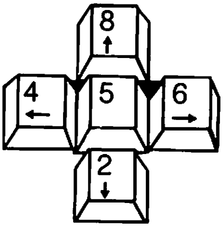


FIGURE 7-5. THE CURSOR-CONTROL KEYS

When you press the **PrtSc** (Print Screen) and the **Shift** keys simultaneously, all of the information currently displayed on your monitor is sent to the current default printer port to be printed. Graphic information can be reproduced only on printers that support graphic printing. If you intend to print graphics display screens, remember to run the **GRAPHICS** command first. See the MS-DOS User's Guide for information about the **GRAPHICS** command.

Pressing the **PrtSc** and **Ctrl** keys simultaneously sends whatever you type in and whatever the computer displays to the current default printer port to be printed. To stop this process, press the **Ctrl** and **PrtSc** keys a. second time.

The **End** key moves the cursor to the same column of the bottom line of the screen. See your application manuals for information on using this key in specific programs.

The **Ins** (Insert) key places you in insert mode. In this mode, any characters you type are inserted where the cursor is positioned. Characters to the right are moved over rather than replaced. Pressing the **Ins** key once begins insert mode. Pressing it a second time cancels insert mode.

The **Del** (Delete) key deletes the character under which the cursor is positioned. All characters to the right move one space to the left as each character is deleted.

The **plus** and **minus** keys enter a plus (+) and minus (–) sign, respectively.

The **Sys Req** uses in a multitasking environment.

MS-DOS FUNCTION AND EDITING KEYS

The MS-DOS function and editing keys are located on the left side of the keyboard and are labeled F1 through F10. These keys are referred to as function keys because they can be programmed to perform different functions. MS-DOS assigns special meanings to these keys. Your or any application program can assign other meanings to the keys. The meanings assigned by MS-DOS provide a flexible and sophisticated method of command—line editing; MS-DOS thus refers to these keys as the editing keys.

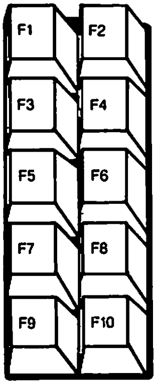


FIGURE 7-6. THE FUNCTION KEYPAD

Although you can use the Backspace key (located above the **Enter** key) to edit command lines before you enter them, the MS-DOS editing keys provide much more flexibility in modifying the command line. For example, you can repeat the last command you entered in two keystrokes instead of retyping the entire command line, or you can edit the last command and reenter it without retyping the complete line. Using the Editing keys thus saves you time because they reduce the number of keystrokes—you do not have to repeatedly type in the same sequence of keys.

NOTE: The function of these keys within each application program may vary, since a software package may reassign specific meanings to these keys.

HOW THE EDITING KEYS WORK

As you type each command line at the system prompt, MS-DOS saves it in memory in an area known as an input buffer. When you press the **Enter** key, the command line is entered and saved in this buffer. The input buffer serves as a template from which you can develop another command line, thereby saving keystrokes. Once a line is saved, you can use the editing keys to reference and edit the line, or you can type in a whole new command line.

Many of the keys on your keyboard automatically reference and work with the input buffer. Following is a description of each of the editing keys and their use. See Figures 7-4 and 7-6 for their location on the keyboard.

The **Del** key, located below the **3** key on the numeric keypad, deletes (skips over) a character in the input buffer. Each time you press this key, one character in the buffer is deleted (skipped). Note that the cursor displayed on your monitor does not move when you press this key.

The **Esc** key, located in the top left corner of the numeric keypad, cancels the command line you are currently entering. When you press this key, a backslash (\) appears at the end of the line you just entered and the cursor drops down to the next line. The command line you now enter will be processed when you press the **Enter** key, and the line you canceled will be ignored.

NOTE: The **Esc** key does not affect the input buffer.

The **Ins** key, located at the bottom left of the numeric keypad, serves as a toggle for insert mode. Pressing this key once turns insert mode on. Pressing the key a second time turns insert mode off. When you start or reset your computer system, insert mode is off. This means that each character you type replaces a character in the input buffer. When insert mode is turned on, the characters you type do not replace characters in the input buffer, but instead move them to the right.

F1 is function/editing key number 1, located at the top left of the function keypad on the left side of your keyboard. This key and the **6/– >** key located on the numeric keypad perform the same function in the input buffer. Each time you press the **F1** or **6/– >** key, one character from the input buffer is copied to the command line.

The **F2** key, used with a letter key copies all characters from the input buffer up to, but not including, the character you specify. For example, if you made a mistake in your last command line, you can copy the correct part of the command from the input buffer to the current command line and then retype the part that was incorrect. If the command line you are about to type is similar to the last one you typed, you can copy the part that is the same from the input buffer to the current command line and then type in the new part.

The **F3** key copies all characters remaining in the input buffer to the current command line. If you have not yet typed any characters, this key copies the complete input buffer, which is the last command line you entered. Pressing the **F3** key and then the **Enter** key lets you repeat the last command you entered without completely retyping it. For example, if you have typed in four characters, pressing **F3** causes the fifth through the last character end of the input buffer to be copied to the current command line.

The **F4** function key, used with a letter key, causes the number of characters up to but not including the character you specify to be ignored in the input buffer. This key lets you ignore characters at the beginning of the previous command line and access the ones at the end of the line.

The **F5** key saves the current command line in the input buffer so that this line becomes the template from which you edit. The current line is not executed until you press the **Enter** key.

The **Sys Req** (System Request) key performs special functions that are defined by the operating system or your application. Refer to the MS-DOS User's Guide and the manuals that come with your application program for complete information.

REASSIGNING KEYS

You can issue special control character sequences within a program that can do the following:

- control screen cursor positioning
- reassign the meaning of any key on the keyboard

The supported control sequences are valid only when issued through MS-DOS function calls 1, 2, 6, and 9. Also, the extended screen and keyboard control device driver, ANSI.SYS, must be installed. To install this device driver, insert the following command in the system configuration file, CONFIG.SYS.

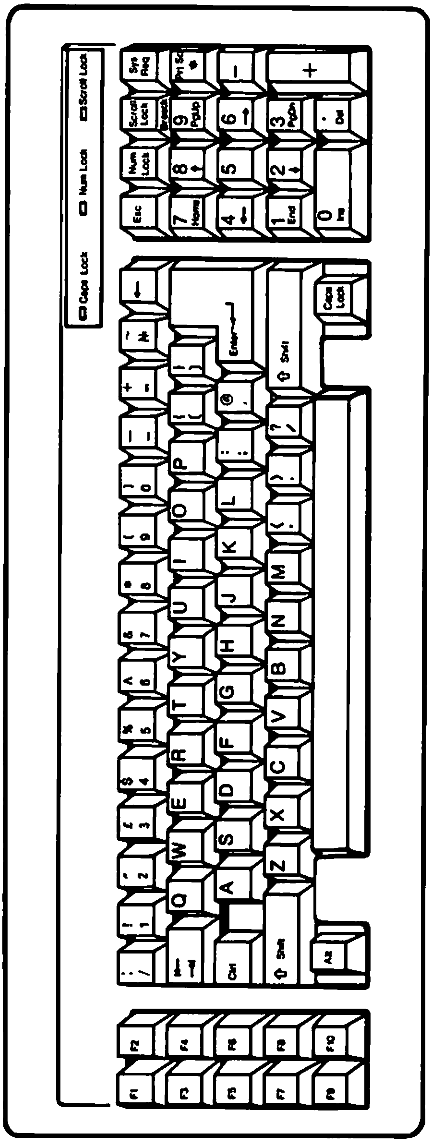
```
DEVICE=ANSI.SYS
```

Note that this command increases the amount of memory DOS takes up by the size of the ANSI.SYS program.

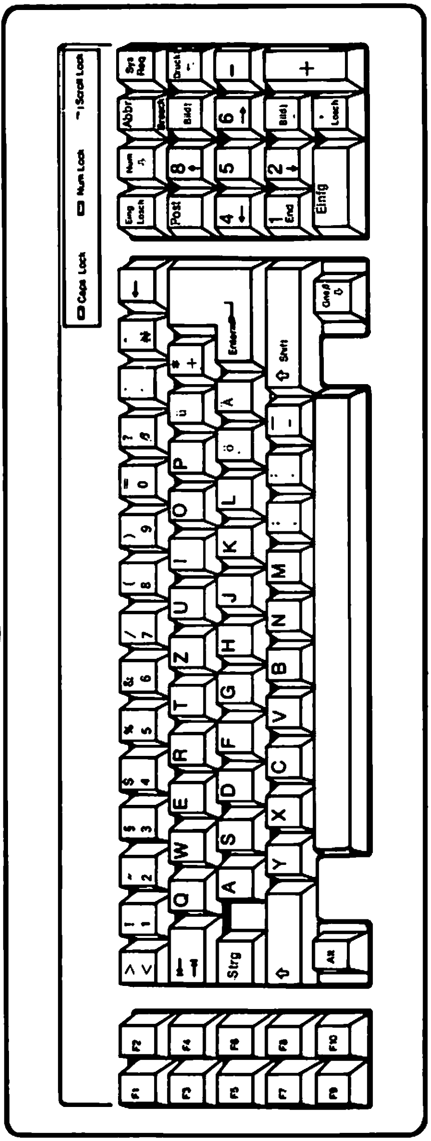
To actually implement the reassigned keyboard keys (or screen cursor positioning), refer to Appendix C in Section 2, MS-DOS User's Guide, in this binder.

NON-U.S. KEYBOARD LAYOUTS

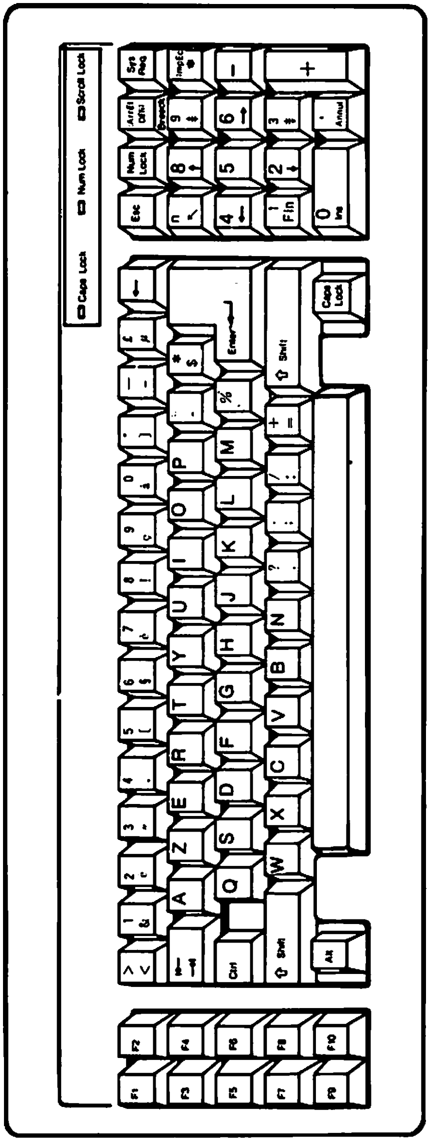
U.K



GERMANY


Caps Lock
Num Lock
Scroll Lock
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
Strg
Alt
Shift
Enter
Einfg
Abbr
Post
End
Q W E R T Z U I O P Ü
A S D F G H J K L Ö Ä
Y X C V B N M

FRANCE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Num Lock
Scroll Lock
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
Ctrl
Shift
Alt
Caps Lock
Enter
Esc
Num Lock
Arrêt Défil
Sys Req
Impécr
Annul
Fin
Ins
A
Z
E
R
T
Y
U
I
O
P
Q
S
D
F
G
H
J
K
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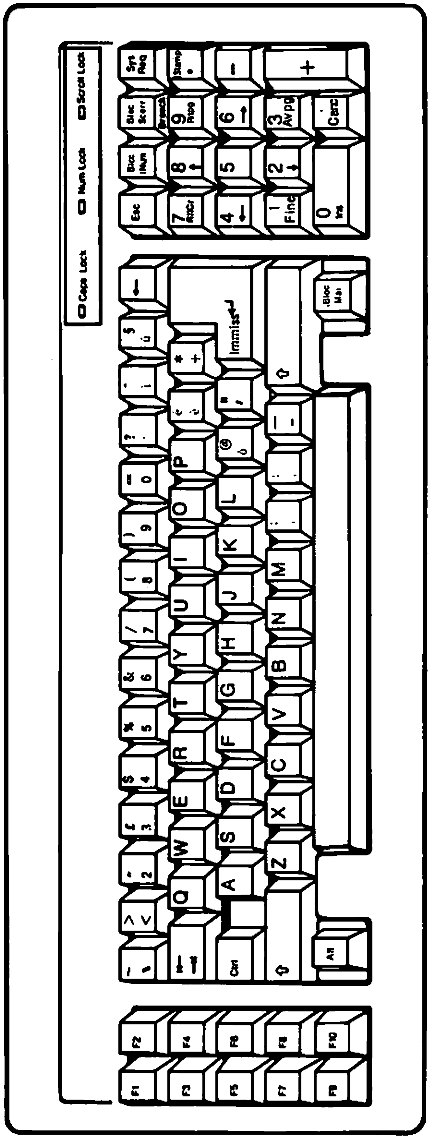
µ
%
$
+
-

ITALY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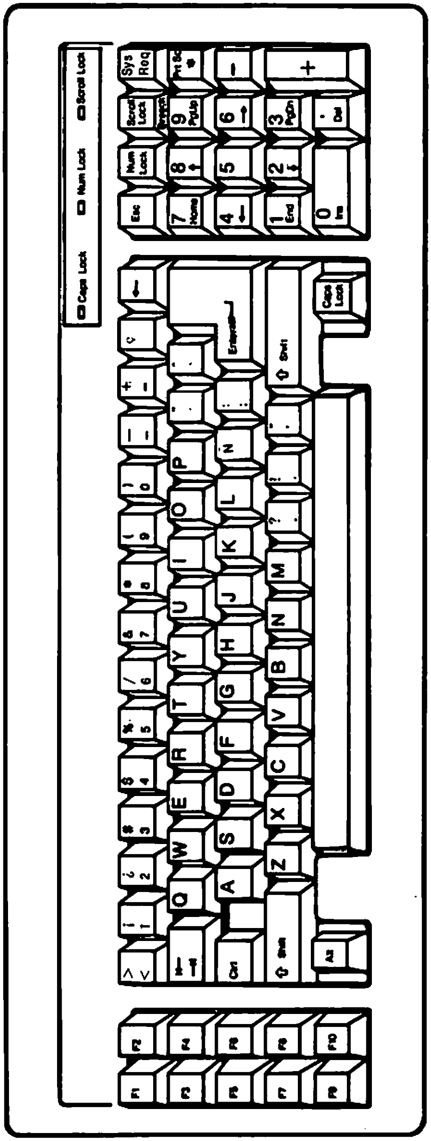
Num Lock
Scroll Lock
Immiss
Ctrl
Alt
Esc
Fine
Ins
Canc
Avpg
Rtpg
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10

SPAIN


Caps Lock
Num Lock
Scroll Lock
Esc
Num Lock
Scroll Lock
Sys Req
Enter
Shift
Shift
Ctrl
Alt
Caps Lock
Q
W
E
R
T
Y
U
I
O
P
A
S
D
F
G
H
J
K
L
Ñ
Z
X
C
V
B
N
M
7 Home
8
9 PgUp
4
5
6
1 End
2
3 PgDn
0 Ins
. Del
+
-
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10

Chapter Eight

System Backup and Regeneration

This chapter tells you how to back up the files on the diskettes supplied with your computer for both diskette and fixed disk systems. In addition, instructions are given for the regeneration of the fixed disk should it become damaged.

BACKING UP SYSTEM FILES

A **backup** diskette is one that contains a copy of information on the original diskette. This duplication is done for safekeeping in case of an accidental erasure or damage caused by a power failure. Each computer model (configuration) comes with two system diskettes, one containing the operating system files and utility programs, and the other containing the another utility programs and configuration program, **SETUP.** When you have set up and started your computer system, you should immediately make a backup copy of each of these diskettes. Always keep at leas one backup copy of each system diskette.

Once you have created backup diskettes of your original system diskettes, put the originals away in a clean, cool, safe place, and work from the backup diskettes.

HOW TO MAKE A BACKUP

The following instructions provide step-by-step procedures to create backup diskettes for both a one-and two-diskette drive system and a system with a fixed disk. Three steps are required to generate a backup of your system diskettes:

- Format new diskettes using the /S option
- Copy the operating system files
- Copy the SETUP program

Because the system diskette is necessary in the daily use of systems that don't have a fixed disk, it is very important to make this backup before anything happens to the original. If your system has a fixed disk, the operating system has already been installed on the fixed disk for you. You will start your computer from the fixed disk, and you do not need to use your system diskette. Be sure to put this diskette away in a clean, cool, safe place to serve as the backup to your fixed disk. Refer to "Fixed Disk Regeneration" at the end of this chapter for instructions on regenerating the fixed disk system. It describes the steps to take to reload the operating system if something happens to your fixed disk.

Use the **DOS COPY** command to make your backup copies. Although the **DISKCOPY** command is often suggested for making quick backups, we do not recommend that you use this command because it does not take into account the fact that two diskettes may not format identically. For example, the **DISKCOPY** command does not consider the fact that bad sectors may be on the target diskette but not on the source diskette.

NOTE: The backup instructions in this chapter produce a double-sided 9-sector-per-track diskette, the standard diskette format used by your computer. To alter this format, you must adjust the parameters of the **FORMAT** command. Refer to Section 2, MS-DOS User's Guide, in this binder for a detailed explanation of the **FORMAT** command.

This chapter tells you how to back up the files on the diskettes supplied with your computer for both diskette and fixed disk systems. In addition, instructions are given for the regeneration of the fixed disk should it become damaged.

BACKING UP SYSTEM FILES

A **backup** diskette is one that contains a copy of information on the original diskette. This duplication is done for safekeeping in case of an accidental erasure or damage caused by a power failure. Each computer model (configuration) comes with one system diskettes, one containing the operating system files and utility programs, and the another utility programs and configuration program, **SETUP.** When you have set up and started your computer system, you should immediately make a backup copy of each of these diskettes. Always keep at leas one backup copy of each system diskette.

Once you have created backup diskettes of your original system diskettes, put the originals away in a clean, cool, safe place, and work from the backup diskettes.

HOW TO MAKE A BACKUP

The following instructions provide step-by-step procedures to create backup diskettes for both a one-and two-diskette drive system and a system with a fixed disk. Two steps are required to generate a backup of your system diskettes:

- Format new diskettes using the /S option
- Copy the operating system files, utility program and setup.

Because the system diskette is necessary in the daily use of systems that don't have a fixed disk, it is very important to make this backup before anything happens to the original. If your system has a fixed disk, the operating system has already been installed on the fixed disk for you. You will start your computer from the fixed disk, and you do not need to use your system diskette. Be sure to put this diskette away in a clean, cool, safe place to serve as the backup to your fixed disk. Refer to "Fixed Disk Regeneration" at the end of this chapter for instructions on regenerating the fixed disk system. It describes the steps to take to reload the operating system if something happens to your fixed disk.

Use the **DOS COPY** command to make your backup copies. Although the **DISKCOPY** command is often suggested for making quick backups, we do not recommend that you use this command because it does not take into account the fact that two diskettes may not format identically. For example, the **DISKCOPY** command does not consider the fact that bad sectors may be on the target diskette but not on the source diskette.

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MAKING BACKUPS ON DISKETTE DRIVE SYSTEMS (MODELS 1 AND 2)

You will need the original system diskettes that came with your computer system and two blank diskettes on which to create the backups. If you have one diskette drive, DOS prompts you change diskettes when necessary. If you have two diskette drives, the top drive is assumed to be drive A: and the bottom drive is assumed to be drive B:.

1. Insert the system diskette labeled Operating System in drive A:. You will use this diskette to start your computer system.

2. If your computer system is off, turn it on. If it is already on, press the reset button or press the **Ctrl**, **Alt**, and **Del** keys simultaneously.

3. Type the **FORMAT** command using the /S option and press the **Enter** key.

   A>**FORMAT** B:/S <**Enter**>

4. When prompted, insert a blank diskette in drive B: and press any key to start the formatting. (If you have only one diskette drive, you are prompted to remove the Operating System diskette and insert a blank one.)

5. When formatting is complete, a message is displayed asking if you want to format additional diskettes. Answer with a **Y.**

6. When prompted, remove the formatted diskette from drive B: and insert the second blank diskette. Press any key to start the formatting.

7. When formatting is complete, a message is displayed asking if you have more diskettes to format. Answer with a **N.** The DOS prompt is displayed.

8. Type the **DOS COPY** command using the /V option to copy the operating system files to the formatted diskette in drive B:. (If you have one diskette drive, remove the formatted diskette and insert the Operating System diskette in the diskette drives: DOS prompts you to change diskettes.)

```
A>COPY *.* B:/V<Enter>
```

The **COPY** *.* command tells your computer system to copy all the files from drive A: to drive B:. The /V option tells it to verify that the files are copied correctly. As the files are copied their names are listed on your display screen.

9. When the operating system files are copied, remove the backup diskette from drive B: and label it. Place a write-protect tab over the write-protect notch and return the diskette to its cover. Use this backup copy each time you start your computer. Put the original diskette in its original cover and store it in a clean, cool, safe place.

10. Insert the system diskette labeled supplemental in drive A:. Insert the second blank formatted diskette in drive B:. (Remember: If you are using a one-diskette-drive system, DOS prompts you to switch diskettes when necessary.)

MAKING BACKUPS ON DISKETTE DRIVE

You will need the original system diskettes that came with your computer system and two blank diskettes on which to create the backups. If you have one diskette drive, DOS prompts you change diskettes when necessary. If you have two diskette drives, the top drive is assumed to be drive A: and the bottom drive is assumed to be drive B:.

1. Insert the system diskette in drive A:. You will use thisdiskette to start your computer system.

2. If your computer system is off, turn it on. If it is already on, press the reset button or press the **Ctrl**, **Alt**, and **Del** keys simultaneously.

3. Type the **FORMAT** command using the /S option and press the **Enter** key.

   ```
   A>FORMAT B:/S <Enter>
   ```

4. When prompted, insert a blank diskette in drive B: and press any key to start the formatting. (If you have only one diskette drive, you are prompted to remove the Operating System diskette and insert a blank one.)

5. When formatting is complete, a message is displayed asking if you want to format additional diskettes. Answer with a **Y**.

6. When prompted, remove the formatted diskette from drive B: and insert the second blank diskette. Press any key to start the formatting.

7. When formatting is complete, a message is displayed asking if you have more diskettes to format. Answer with a **N**. The DOS prompt is displayed.

8. Type the **DOS COPY** command using the /V option to copy the operating system files to the formatted diskette in drive B:. (If you have one diskette drive, remove the formatted diskette and insert the Operating System diskette in the diskette drives: DOS prompts you to change diskettes.)

```
A>COPY *.* B:/V<Enter>
```

The **COPY** *.* command tells your computer system to copy all the files from drive A: to drive B:. The /V option tells it to verify that the files are copied correctly. As the files are copied their names are listed on your display screen.

9. When the operating system files are copied, remove the backup diskette from drive B: and label it. Place a write-protect tab over the write-protect notch and return the diskette to its cover. Use this backup copy each time you start your computer. Put the original diskette in its original cover and store it in a clean, cool, safe place.

11. Type the **DOS COPY** command using the /V option to copy the **SETUP** program to the diskette in drive B: and press the **Enter** key.

```
A>COPY *.* B:/V<Enter>
```

12. When the **SETUP** program is copied, remove it and store it in a safe place. Then remove the backup diskette from drive B: and label it. Place a write-protect tab over its write-protect notch and return it to its cover. Use this backup copy if you need to make configuration changes. The **SETUP** program is explained in Chapter 12.

This completes the procedure to make a backup of your system diskettes on systems without a fixed disk.

MAKING BACKUPS ON FIXED DISK SYSTEMS (MODEL 3)

Use the following procedure to make a backup of the system diskettes that come with your Model 3 computer. You will need the diskette labeled **SETUP** and two blank diskette on which to create the backup copy. You will copy the operating system files from the fixed disk to one of the diskettes, and the **SETUP** program files from the **SETUP** diskette to a second diskette.

NOTE: Because the operating system files are already installed on the fixed disk, the operating system diskette that comes with your computer is your backup. You can make a second backup of the operating system if you want, or you can back up only the SETUP program. Following are the produces for both backups.

1. Start your computer from the fixed disk. If your computer system is off, turn it on. If it is already on, press the reset button or press the **Ctrl, Alt,** and **Del** keys simultaneously.

2. Type the **FORMAT** command using the /S option and pression the **Enter** key as shown below. Be sure to indicate that you are formatting a diskette in drive A:. Do NOT format drive C:, the fixed disk.

```
C>FORMAT A:/S<Enter>
```

3. When prompted, insert a diskette in drive A:, and then press any key to start formatting.

4. When the format is complete, a message is displayed asking if you have more diskettes to format. Answer with a **Y.**

5. When prompted, remove the formatted diskette from drive A: and insert a new diskette. Press any key to start the formatting.

6. When the format is complete, a message is displayed asking if you have more diskettes to format. Answer with an **N.**

7. Type the **DOS COPY** command to copy the operating system files on the fixed disk to the diskette in drive A:.

```
C>COPY *.* A:/V<Enter>
```

USING HIGH-AND NORMAL-CAPACITY DISKETTE DRIVES

Diskette drives and diskettes are categorized according to the amount of data they can process. A **high-capacity** drive and diskette hold 1.2 MB (megabytes) of information; a **normal-capacity** drive and diskette hold 360 KB (kilobytes) of information.

DISKETTE AND DISK DRIVE COMPATIBILITY

The following chart shows the comaptibility between 1.2 MB disk and 360 KB disk.

	360 KB Diskette (Normal Capacity)	1.2 MB Diskette (High Capacity)
360KB Drive	Read/Write	Do not use
1.2MB Dirve	Read Only	Read/Write

Note:
- Use only 1.2 MB diskettes to read and write in the 1.2 MB format with 1.2 MB drive.
- Use only 360 KB diskette in the 360KB drive.
- If your write on 360 KB diskette with a 1.2 MB drive, then no matter how the disk was formatted, the disk will be useable only in a 1.2 MB drive.
  The diskette must be reformatted to be used reliably in a 360 KB drive.

FIXED DISK REGENERATION

A fixed disk system regeneration includes the steps needed to reload the operating system should the fixed disk become damaged. There are several reasons why the data on your fixed disk may become damaged or destroyed. The most common reasons are

- an accidental erasure of the files
- a power surge
- failure to transport the system carefully

FOR YOUR NOTES

This command tells your computer system to copy everything from drive C: to drive A: and to verify that the files were copied correctly. As the files are copied, their names are listed on the display screen.

8. When all the files are copied, remove the backup diskette from drive A: and label it. Place a write-protect tab over the write-protect notch and return the diskette to its cover. Store this backup diskette in a clean, cool, safe, place.

9. Insert the **SETUP** program diskette in drive A:. Type the **COPY** command to copy the **SETUP** program from the diskette. (Because you have only one diskette drive, **DOS** prompts you to change diskettes at the appropriate time.)

```
A>COPY *.* B:/V <Enter>
```

10. When prompted, remove the **SETUP** program diskette and insert the second blank formatted diskette. Press any key to start the formatting.

11. When all the files are copied, remove the backup diskette from the diskette drive and label it. Place a write-protect tab over the write-protect notch and return the diskette to its cover. Store both the original and the backup diskette in a clean, cool, safe place.

This completes the procedure to make a backup of the operating system files and the **SETUP** program on a fixed disk system.

MAKING BACKUPS ON TAPE BACKUP DRIVE SYSTEMS (MODEL 4)

Special software is provided with your Model 4 system for backup. Use this software to back up system files.

USING HIGH-AND NORMAL-CAPACITY DISKETTE DRIVES

Diskette drives and diskettes are categorized according to the amount of data they can process. A **high-capacity** drive and diskette hold 1.2 MB (megabytes) of information; a **normal-capacity** drive and diskette hold 360 KB (kilobytes) of information.

DISKETTE AND DISK DRIVE COMPATIBILITY

The following chart shows the comaptibility between 1.2 MB disk and 360 KB disk.

	360 KB Diskette (Normal Capacity)	1.2 MB Diskette (High Capacity)
360KB Drive	Read/Write	Do not use
1.2MB Dirve	Read Only	Read/Write

Note:
- Use only 1.2 MB diskettes to read and write in the 1.2 MB format with 1.2 MB drive.
- Use only 360 KB diskette in the 360KB drive.
- If your write on 360 KB diskette with a 1.2 MB drive, then no matter how the disk was formatted, the disk will be useable only in a 1.2 MB drive.
  The diskette must be reformatted to be used reliably in a 360 KB drive.

FIXED DISK REGENERATION

A fixed disk system regeneration includes the steps needed to reload the operating system should the fixed disk become damaged. There are several reasons why the data on your fixed disk may become damaged or destroyed. The most common reasons are

- an accidental erasure of the files
- a power surge
- failure to transport the system carefully

If you follow the guidelines outlined in Chapter 9 and are careful to back up your system regularly, damage to the fixed disk is not likely to occur. If you cannot start your system from the fixed disk, then a system regeneration may be necessary.

The procedure for a fixed disk regeneration includes formatting the fixed disk and copying the operating system from the backup diskette onto the fixed disk. The steps to take to do this are listed below. You need the original system diskette that contains the operating system, or a backup.

1. Insert the System diskette into drive A:.
2. If your computer system is off, turn it on. If it is already on, press the reset button or press the **Ctrl, Alt** and **Del** keys simultaneously.
3. To format the fixed disk, type the **FORMAT** command using the /S option, and press the **Enter** key.

```
A>FORMAT C:/S <Enter>
```

4. Presss any key to start the formatting process. When formatting is complete, the **DOS** system prompt is displayed.
5. To copy the operating system files from the diskette to your fixed disk, type the **COPY** command using the /V option, and press **Enter.**

```
A>COPY A: *.* C:/V<Enter>
```

As the files are copied their names are listed on the display monitor. The /V option requests that the copy be verified.

6. When all the files are copied, remove the system diskette from the diskette drive and return it to its cover. Store it in a clean, cool, safe place.

This completes the fixed disk regeneration procedure. You can now start your computer from the fixed disk and begin reloading your application software. Be sure to keep backup copies of all data files on diskette so that these files can be copied back to the fixed disk in the event of a fixed disk failure.

Chapter Nine

Taking Care of Your Computer System

The following are some guidelines you should follow when using your computer.

USE THE PROPER POWER SOURCE

The power source you use (115 volts or 220/240 volts) must match the voltage switch setting located on the rear panel of the system unit. Most United States power sources use 115 volts; many European power sources use 220/240 volts. If you are not sure of the type of electric power you have, consult your dealer or local power company.

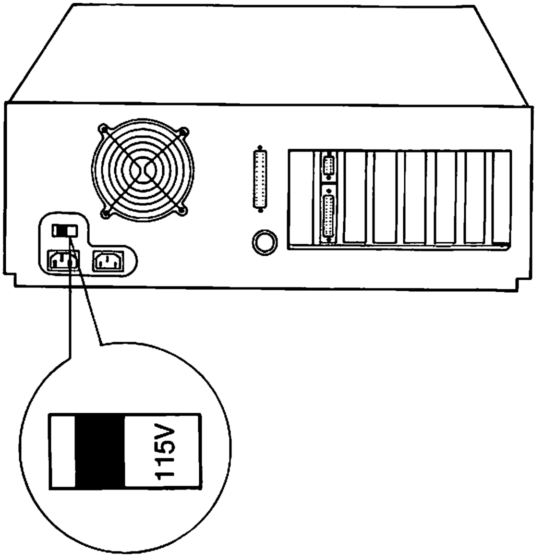


FIGURE 9-1. THE VOLTAGE SELECTION SWITCH

GUARD AGAINST IRREGULAR ELECTRICAL CURRENTS

Computer system components can be damaged by improper electrical currents that produce static electricity or an electrical current that is too high or too low. The quality of electrical current is generally controlled by your electric utility company. Computer warranties do not covers failures due to faulty or irregular electrical currents, but you can guard against losses of this nature by using protective devices such as a surge suppressor and an uninterruptable power supply (UPS). If you suspect static or irregular power problems, contact your dealer or distributor.

TAKE GOOD CARE OF THE POWER CORDS

Your computer system has two power cords—one that connects the system unit to a wall outlet and one that connects the display monitor to either the system unit or a wall outlet.

In the United States, both of these power cords have a 3-pronged grounded plug. They will fit only into a grounded type power outlet.

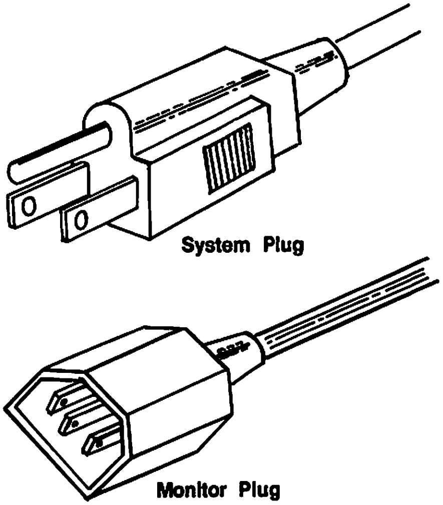


FIGURE 9-2. GROUNDED PLUGS

This is a safety feature. If the connector does not fit, or if you cannot insert it into an outlet easily, find another outlet or contact an electrician or your dealer. Do Not force it. Doing so will defeat the safety purpose of the grounding plug.

In Europe, a power cord adapter is required. Be sure to use it properly.

If you notice that the power cord or plug is damaged, shut down your computer system immediately and replace the power cord.

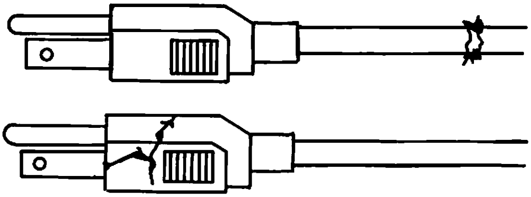


FIGURE 9-3. DAMAGED POWER CORD AND PLUG

Do not set your display monitor or system unit on top of the power cords. Be sure that all connections are secure and that any extra cord is placed out of the way so it will not get caught on anything or trip someone.

To disconnect a power cord, pull it out by holding the plug. Never pull the cord itself.

DO NOT KEEP YOUR COMPUTER SYSTEM IN DIRECT SUNLIGHT OR HIGH TEMPERATURES

When deciding where to put your computer system, avoid placing any part of it in direct sunlight, near a heat-generating device such as a radiator or air duct, or near a source of moisture or steam. These extreme conditions can damage your system. A good rule of thumb is to place your computer system in a place where you would be comfortable at all times.

KEEP YOUR COMPUTER SYSTEM IN A WELL-VENTILATED PLACE

Be sure to place your system in an area with plenty of ventilation.

The various components of your computer system have ventilation holes to reduce the internal temperature of the unit. Do not cover the ventilation holes with materials such as paper, tape, or cloth, and do not place the computer system near materials, such as curtains, that can block the ventilation holes.

KEEP LIQUIDS AND MOISTURE AWAY FROM YOUR COMPUTER

Liquids, such as water or soda, can damage your computer system or make it dangerous to use. Be careful not to spill anything on the computer's components. If liquids are spilled, immediately disconnect your system and contact your dealer or distributor for assistance.

BE CONSCIOUS OF THE SOUNDS OF YOUR COMPUTER SYSTEM

As you work with your computer system, you will accustomed to its many sounds. If your computer makes an unusual sound that you cannot identify, shut down the system and consult your dealer.

SAVE THE ORIGINAL SHIPPING MATERIALS

The original shipping container and packing materials are helpful if you have to transport your computer system. For maximum protection, repack your system in the same way it was originally packed.

HANDLE THE COMPUTER SYSTEM WITH CARE

Various parts of your computer system are breakable. Handle all the components with care. Do not drop them, bang them around, or place them on an unstable surface.

DO NOT LET FOREIGN OBJECTS ENTER THE COMPONENTS

Objects such as paper clips or thumbtacks can damage your computer system or make it dangerous to use. Do not drop them into your computer system. If anything is dropped inside any component, immediately shut down your system and contact your dealer or distributor for assistance.

CLEANING YOUR COMPUTER SYSTEM

Before cleaing your computer system, disconnect it from the AC wall receptacle. Use a soft, damp cloth with a mild soap to clean your system unit, display monitor, and keyboard. Never use strong solvents, such as thinner or benzene, or abrasive cleaners. Clean only the outside of the system, and be careful not to get any liquid inside the diskette drive openings. Never apply liquids directly to the components; moisten the cloth first.

A window cleaner can be used to remove dust and fingerprints from the display monitor screen.

WHEN YOUR COMPUTER SYSTEM IS NOT IN USE

Always turn the computer system off when you are not using it. If you will be away from your system for an extended period of time (for example, over the weekend), disconnect the power cord from the wall socket. Cover the components to keep out dust and other foreign matter.

TRANSPORTING YOUR COMPUTER SYSTEM

This section lists the steps you should follow if you move your computer system.

1. Back up all files. If you are going to transport your computer system over a long distance and you have a fixed disk in your system, it is recommended that you do a complete backup of all files to diskette.

2. Remove any diskette(s) that are in the diskette drive(s)

3. If your system has a fixed disk, it is important that you run the SHIPDISK utility program at this time. This utility moves the disk heads to a part of the disk that is not used and helps prevent loss of data. See "Turning Your System Off", in Chapter 5, for instructions on running this utility.

4. Turn off the display monitor and the system unit.

5. Disconnect the system unit from the electrical outlet.

6. Unplug the display monitor from the system unit or from the electrical outlet, depending on where it is connected.

7. Disconnect all cables from the rear panel of your system unit.

8. Disconnect the keyboard from the system unit.

9. Coil all cables to protect their connectors. Group the loose cables together so that you do not lose any.

If you are moving your computer system from one room to another, carefully carry each piece to the new location. Set all components down in clean, dry places. Do not stack the components. Once everything has been moved to the new location, follow the instructions in Chapter 4, Installing Your Computer System, to put it back together.

If you are moving your system over a long distance, containue with the following steps:

10. Insert a cardboard diskette drive head protector into each diskette drive.

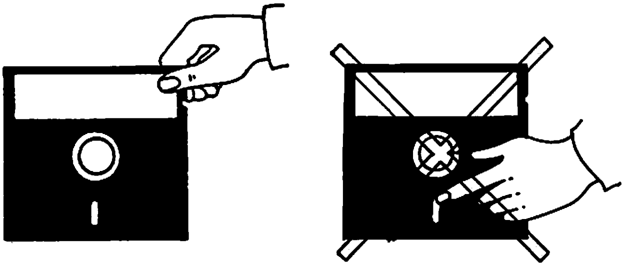
11. Repackage each component in its original packing box. If you do not have the original shipping containers, pack the components in well-cushioned containers.

12. When you have moved all the components to the new location, unpack them and follow the instructions in Chapter 4, Installing Your Computer System, to put the system back together.

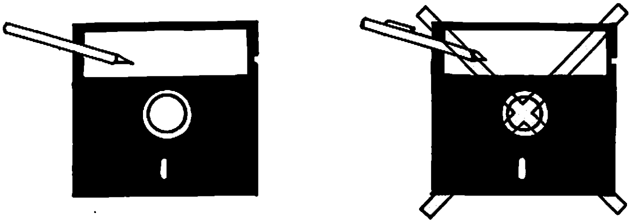
TAKING CARE OF DISKETTES

Use the following guidelines when using diskettes:

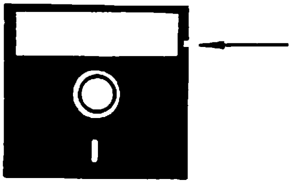
- Hold a diskette by the covered areas—usually a corner. Never touch the exposed parts of the diskette.



- Use felt tip pens to write on the diskette labels. Do not use ball point pens or other hard pointed instruments.



- Place write-protect tabs on diskettes that contain important information. When a diskette is write—protected, no information can be written to the diskette. To write-protect a diskette, cover the notch in the diskette with an adhesive tab. These tabls are usually included when you buy diskettes. Remove this tab if you need to write data to the diskette.



- Put diskettes back into their protective covers when you are not using them.
- **Do not** bend or fold diskettes.
- **Do not** attach clips or rubber bands to your diskettes.
- **Do not** expose diskettes to direct sunlight or high temperature.
- **Do not** expose your diskettes to magnetic fields such as a television set or power supply.

FOR YOUR NOTES

Chapter Ten

Using the Serial and Parallel Ports

All four computer models come with two serial ports and one parallel port to which you can attach communication devices such as printers. All three ports are located on the serial/parallel adapter board that is installed in your computer.

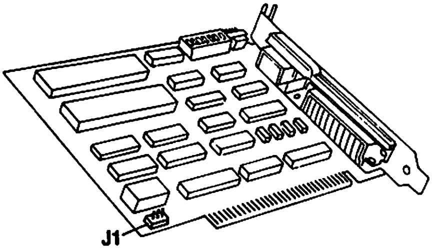


FIGURE 10-1. SERIAL/PARALLEL ADAPTER BOARD

This chapter describes the location and use of each of these ports as well as the required switch settings for each. To connect your printer to the system, check which type of interface (serial or parallel) the printer uses and connect it to the corresponding port. If you are going to purchase a printer, remember that your computer can support either type.

THE SERIAL PORTS

There are two serial ports on the serial/parallel adapter board in your computer. The primary serial port has a 9-pin connector and the second port has a 25-pin male D-shell connector, sometimes referred to as a DB-25 connector.

Figure 10-2 is a diagram of the rear panel of the system unit, showing the location of each of the serial port connectors.

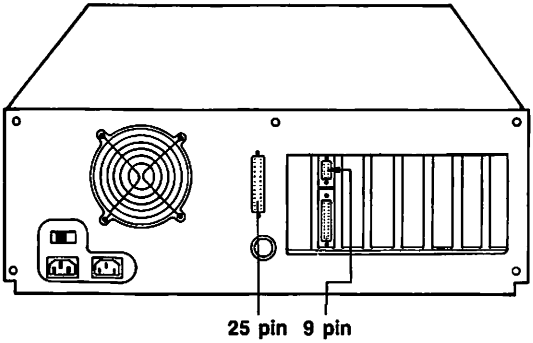


FIGURE 10-2. THE SERIAL PORT CONNECTORS

The operating system keeps track of ports and the devices they are connected to by associating each of them with a port identifier. These identifiers are assigned at the factory as follows:

Serial port with 9-pin connector = COM1:
Serial port with 25-pin connector = COM2:

These settings can be changed.

Whenever you start or reset your computer system, the operating system checks to see which serial port it is using. Each port identifier can be associated with only one device at a time. If you add an internal device, such as an internal modem, that does not connect to one of the external ports, you must disable one of the serial ports on the serial/parallel adapter board. Refer to the documentation for the device you are adding to determine the port identifier it uses.

HOW TO USE A SERIAL PORT

The serial ports on your computer are intended for use as printer or communications ports. To use one of the serial ports, connect the female end of the appropriate cable into the port. Connect the other end to the correct port on your printer or communications device.

PRINTER REDIRECTING OUTPUT

Your system is set up to receive printer output from the parallel port associated with the port identifier LPT1:. If you want to use a printer with a serial port, you must redirect the output being sent to the printer to the appropriate serial port identifier (COM1: or COM2:). Use the DOS MODE command to redirect output. For example, to redirect printer output from LPT1: to COM1:, you would type

```
A>MODE LPT1: =COM1 <Enter>
```

For complete information about the **MODE** command, see Section 2, MS-DOS User's Guide.

THE PARALLEL PORT

The parallel port that comes with your computer is a 25-pin female D-shell Centronics parallel port connector. This connector, like the 25-pin serial connector, is sometimes referred to as a DB-25 connector.

Below is a diagram of the rear panel of the system unit showing the location of the parallel port connector.

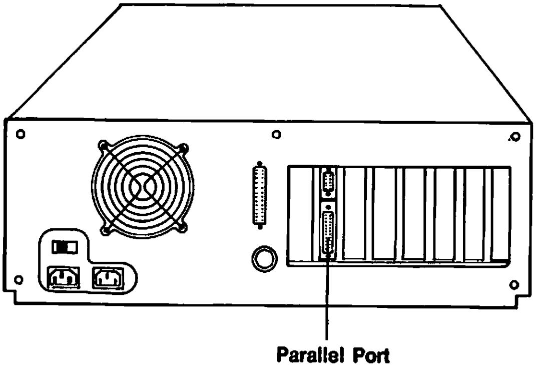


FIGURE 10–3. THE PARALLEL PORT CONNECTOR

The factory assigns the parallel port on your computer the port identifier LPT1:. Unless you change this assignment, the operating system associates the parallel port with LPT1:. If you add an expansion board that contains a parallel port, it cannot conflict with the existing parallel port, that is, you cannot have two ports associated with LPT1:. In this case you must reassign one of the ports to a different port identifier (LPT2: or LPT3:). Use the **DOS MODE** command to reassign a port identifier.

HOW TO USE THE PARALLEL PORT

The parallel port on your computer is intended for use as a printer port. To use the parallel port, plug the male end of the Centronics parallel cable into the port. Connect the other end to the appropriate port on your printer. Follow the directions in your printer manual to turn the printer on and do any self-testing.

When you have connected your printer to the port, you can print from either application programs or the operating system. Refer to the description of the **Prt Sc** key in Chapter 7 of this manual and to Section 2, the MS-DOS User's Guide, in this binder for information on sending output to the printer.

PIN ASSIGNMENTS

Serial communication ports on printers and communications devices fall into two categories: **DTE** (Data Terminal Equipment) and **DCE** (Data Communications Equipment). The ports on your computer are designed to communicate with **DTE** devices. The ports on your computer are designed to communicate with **DTE** devices. The cables that connect devices to your system have connectors at each end composed of pins. The pins make the electrical connection that allows the signal to pass through the cable. When you connect a **DTE** device to your system such as a display monitor or a serial printer, you need to use a special cable called a null modem cable that uses pin assignments that are different from those in the cables supplied with your computer. If you are using a **DCE** device such as a modem, you need a regular (flat) cable. See the documentation that comes with your printer of modem to determine whether it is a **DTE** or **DCE** device.

The pin assignments for both the 25-pin connector and the 9-pin connector are shown below. Refer to these settings if you use a cable other than the one supplied with your computer.

PIN ASSIGNMENTS FOR THE 9-PIN SERIAL CONNECTOR

"Direction" refers to whether the signal is flowing into or out of the computer.

Signal Pin Number	Signal	Direction	Description
1	DCD		Data Carrier Detect
2	RD	In	Receive Data
3	TD	Out	Transmit Data
4	DTR	Out	Data Terminal Ready
5	SG		Signal Ground
6	DSR	In	Data Set Ready
7	RTS	Out	Request to Send
8	CTS	In	Clear to Send
9	RI	In	Ring Indicator

PIN ASSIGNMENTS FOR THE 25-PIN SERIAL CONNECTOR

"Direction" refers to whether the signal is flowing into or out of the computer.

Signal Pin Number	Signal	Direction	Description
2	TD	Out	Transmit Data
3	RD	In	Receive Data
4	RTS	Out	Request to Send
5	CTS	In	Clear to Send
6	DSR	In	Data Set Ready
7	SG		Signal Ground
8	DCD		Data Carrier Detect
20	DTR	Out	Data Terminal Ready
22	RI	In	Ring Indicator

PIN ASSIGNMENTS FOR THE 25-PIN CENTRONICS PARALLEL CONNECTOR

"Direction" refers to whether the signal is flowing into or out of the printer.

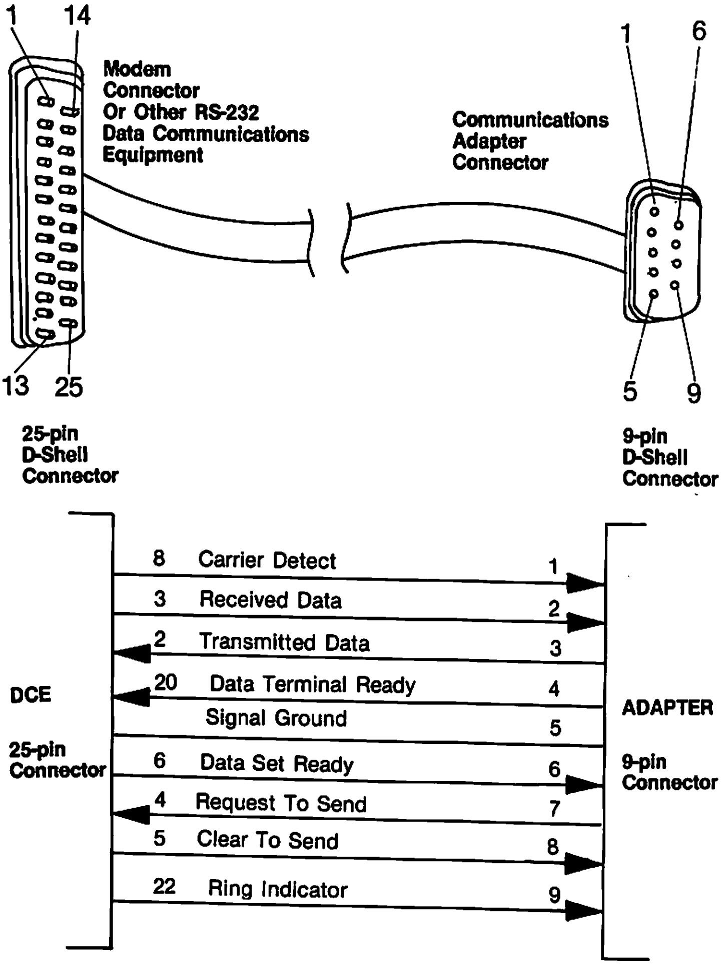
Signal Pin Number	Signal	Direction	Description
1	$\overline{\text{STROBE}}$	In	STROBE pulse to read data in. Pulse width must be more than 0.5 us. at receiving terminal. Signal level is normally "high". Signal is active "low" i.e., data is read in at signal level of "low"
2	DATA0	In	These signals represent the first through eighth bits of parallel data, respectively. Signal is "high" when data is logical 1 and is "low" when data is logical 0.
3	DATA1	In	
4	DATA2	In	
5	DATA3	In	
6	DATA4	In	
7	DATA5	In	
8	DATA6	In	
9	DATA7	In	

Signal Pin Number	Signal	Direction	Description
10	$\overline{\text{ACKNLG}}$	Out	Approx. 5 us. pulse. "Low" means the data has been received and the printer is ready to accept more.
11	BUSY	Out	Signal is "high" when the printer cannot receive data. A "high" will occur -during data entry -during printing -when printer is offline -during printer error state
12	PE	Out	"High" signal indicates the printer is out of paper.
13	SLCT	Out	"High" signal indicates that the printer is selected.
14	$\overline{\text{AUTO FEED XT}}$	Out	When "low", paper is automatically fed one line after printing. Specially is normally "low".
15	$\overline{\text{ERROR}}$	In	Active "low".

Signal Pin Number	Signal	Direction	Descriptions
16	$\overline{\text{INT}}$	In	Signal is "low" when the printer controller is reset to its initial state and the printer buffer is cleared. Signal is normally "high". Its pulse width must be more than 50 us. at the receiving terminal.
17	$\overline{\text{SLCT IN}}$	In	Signal is "low" when printer is ready to accept data for printing.
18-25	GND		Ground level.

COMMUNICATION CABLE SPECIFICATIONS

One connector is a 9-pin D-shell connector and the other is a 25-pin D-shell connector. The pin numbering and connector specifications follow.



NOTE: All other pins on the 25-Pin connector are not used.

FIGURE 10-4. THE COMMUNICATION CALBE SPECIFICATIONS

CHANGING SWITCH SETTINGS

This section lists the switch settings for each of the three ports. These settings need to be changed only if you change the physical port associated with a port identifier. For example, if you are adding an internal modem, you must disable one of the serial ports and adjust the switch settings accordingly.

Your computer comes with the switch settings set to reflect the following: the 9-pin serial port is COM1:; the 25-pin serial port is COM2:; the 25-pin parallel port is LPT1:.

The switches are located on the serial/parallel adapter board as shown in Figure 10-5.

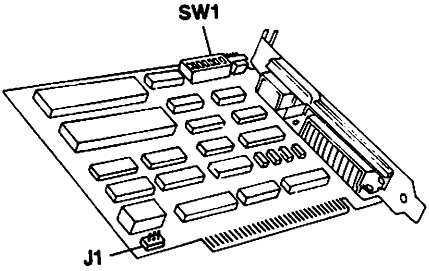


FIGURE 10-5. LOCATION OF SWITCHES ON SERIAL/PARALLEL ADAPTER BOARD

SWITCH SETTINGS FOR SERIAL PORTS

The following table shows you the switch settings for switches 1 through 8. These switch settings determine which channel (A or B) on the serial/parallel adapter board is assigned to **COM1:** and which is assigned to **COM2:**. One channel can be assigned to **COM1:** and one channel can be assigned to **COM2:**. The default assignments are **COM1:** for Channel A and **COM2:** for channel B. Each channel must be assigned a unique interrupt; both channels cannot, for example, use **IRQ3**. In addition, both channels cannot be **COM1:** or **COM2:** at the same time; if both **SW6** and **SW8** are open, or if both **SW6** and **SW8** are closed, both channels will be disabled.

The switch settings in the table below assume the following:

COM1: = I/0 Address 3F8
COM2: = I/0 Address 2F8
O = Open **C** = Closed **X** = Don't Care

Channel A Selections

SW1	**SW2**	**SW5**	**SW6**	
X	X	O	X	Channel A Not Used ✓
O	C	C	C	Channel A = COM1: IRQ3 ✓
C	O	C	C	Channel A = COM1: IRQ4
O	C	C	O	Channel A = COM2: IRQ3
C	O	C	O	Channel A = COM2: IRQ4

Channel B Selections

SW3	**SW4**	**SW7**	**SW8**	
X	X	O	X	Channel B Not Used
O	C	C	C	Channel B = COM1: IRQ4
C	O	C	C	Channel B = COM1: IRQ3
O	C	C	O	Channel B = COM2: IRQ4 ✓
C	O	C	O	Channel B = COM2: IRQ3 ✓

SWITCH SETTINGS FOR PARALLEL PORTS

Use switches 9 and 10 to assign a parallel port as either the primary port (LPT1:) or the secondary port (LPT2:). The settings below assume the following:

Primary (LPT1)=378
Secondary (LPT2)=278

O=Open C=Closed

SW9	SW10	
O	O	No parallel port
C	C	Primary port 378
C	O	Secondary port 278

The jumper switch at J1 is used to select the interrupt used for parallel port interrupts.

J1	
1-2	IRQ5
2-3	IRQ7
No Switch	No interrupt selected

Chapter Eleven

Upgrading Your System

Upgrades for your computer system are available from your dealer or distributor. Memory expansion is probably the most frequent upgrade to a computer. As new and more sophisticated programs have been developed, the memory requirements to support them have increased.

Most upgrades and system enhancements involve adding boards or exchanging boards. This chapter outlines the procedures for adding or exchanging boards. Refer to the instructions accompanying your upgrade kits for details on your specific upgrades.

ADDING MEMORY

Your computer has a standard 512 KB of internal memory, located on memory "chips" that are inserted on the system board. If you want to add more memory, you can purchase additional memory chips or add a memory board. Up to 1 MB of memory can be added to your computer using 256 Kbit memory chips. If you want more than 1 MB of memory, you must add a memory board. When you add memory to your computer, you must run the SETUP program to change the memory configuration. If you want to use 640 KB of memory on mother board, you can use either 64 Kbit or 256 Kbit DRAMs.

CAUTION

You have to use DRAM which access time is under 120 nS.

Follow the steps below if you are adding additional memory chips or a memory board to your computer.

1. If you have a fixed disk in your computer system, run the SHIPDISK utility. This positions the disk heads to a portion of the fixed disk that contains no data so that the disk will not be damaged if it is moved. See "Turning Your System Off", in Chapter 5, for information on running this utility.
2. Turn Off the display monitor and the system unit.
3. Disconnect the display monitor from the system unit or from the electrical outlet, depending on where you have it connected.
4. Disconnect the system unit from its electrical outlet.
5. Remove the five cover mounting screws at the back of the system unit and put them in a safe place. Figure 11-1 shows where they are located.

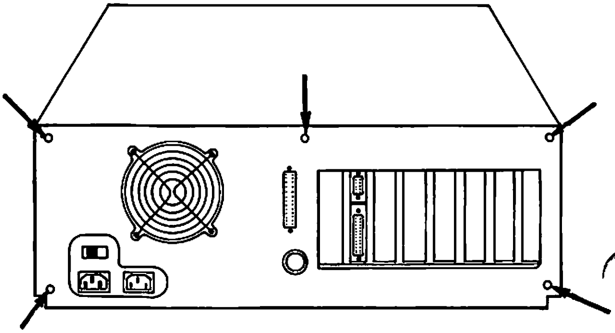


FIGURE 11-1. LOCATION OF COVER SCREWS

6. Carefully remove the cover by sliding it toward the front until it will go no further and then tilt the cover up from the front.

7. Turn the system unit so that the front faces you. Find the system board. It is the large board that sits parallel to the system unit. Next, find the memory area at the front left of the board.

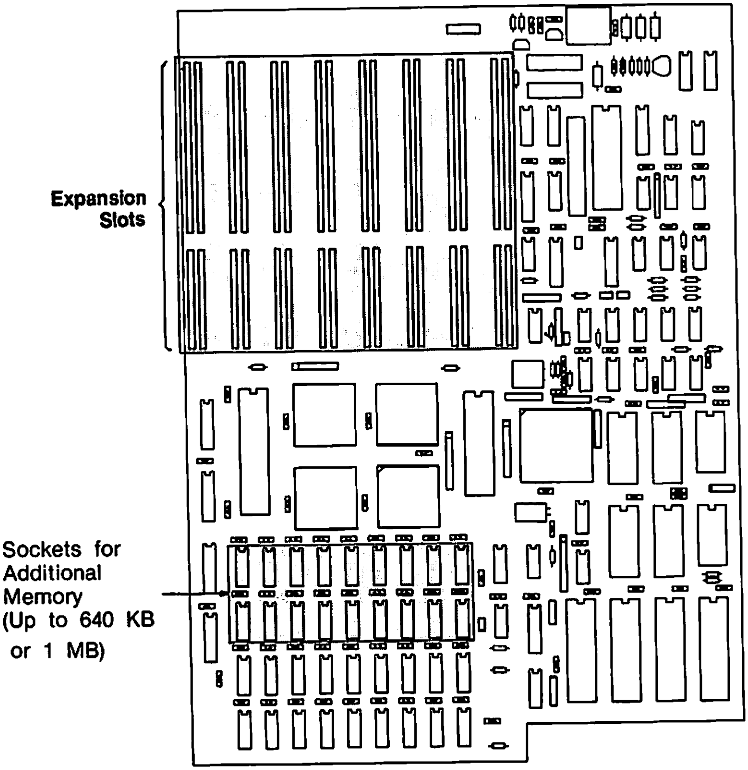


FIGURE 11-2. SYSTEM BOARD SHOWING LOCATION OF MEMORY

8. Carefully insert a memory chip into an empty memory socket, taking care not to bend the prongs. Begin adding chips on the row next to the one that is filled. If you are adding a memory board, see "Adding or Changing Boards" later in this chapter.

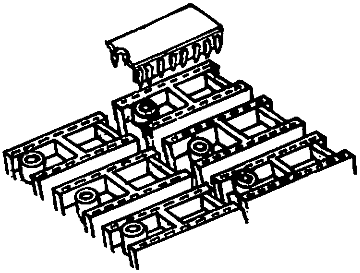


FIGURE 11-3. MEMORY CHIPS AND NOTCHES ON MEMORY SOCKET

9. When you have added all the memory chips that you want, place the cover back on top of the system unit and replace the five screws. Be sure to tighten them well.

10. Reconnect the cables and power.

11. Run the SETUP program to change the configuration. See Chapter 12 for information about using SETUP.

ADDING OR CHANGING BOARDS

Many of the changes you will want to make to your computer can be done by adding or changing one or more boards inside the system unit.

To add or change a board, follow these steps:

1. If you have a fixed disk in your computer system, run the SHIPDISK utility. This positions the disk heads to a portion of the fixed disk that contains no data so that the disk will not be damaged if it is moved. See "Turning Your System Off", in Chapter 5, for information about running this utility.

2. Turn off the display monitor and the system unit.

3. Disconnect the display monitor from the system unit or from the electrical outlet, depending on where you have it connected.

4. Disconnect the system unit from its electrical outlet.

5. Remove the five cover mounting screws at the back of the system unit and put them in a safe place. See Figure 11-1 for the location of these screws.

6. Carefully remove the cover by sliding it toward the front until it will go no further and then tilt the cover up from the front.

   Expansion cards and available slots are located at the left rear of the system unit.

7. Identify the board you are replacing or the slot in which you are adding a board.

8. If you are replacing a board, remove the screw that fastens the board to the rear panel. If you are adding a board, remove the screw that fastens the cover plate to the rear panel. Save the screw so that it can be used to secure the new board in place. Keep the cover plate in case you later remove the board. If you are replacing a board, remove the board and store it in a clean, cool, safe place.

9. Follow the instructions that came with the new board to install it correctly. If any switches need to be reset, be sure to set them correctly before you install the board.

10. Securely fasten the board into place using the screw that you saved from Step 8.

11. Replace the system unit cover and replace the five screws, being sure to tighten them well.

12. Reconnect the cables and power.

13. Run the SETUP program to reset the configuration. See Chapter 12 for information about using SETUP.

SWITCHING MONITOR BOARDS

If you switch from a monochrome monitor to a color monitor, you will need to add a color adapter board. When you do this, you must change the jumper labeled JP1 on the system board.

To adjust the jumper for a color adapter board, place a shorting plug over the prongs.

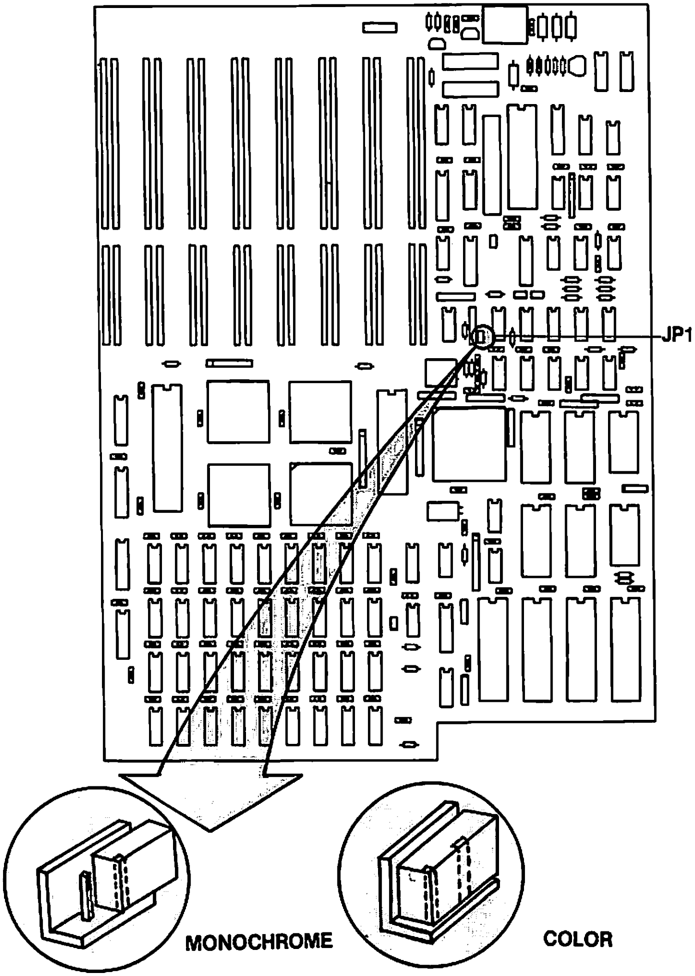


FIGURE 11-4. LOCATION AND PLACING PLUG OF JUMPER JP1 ON SYSTEM BOARD

DISABLING THE DISKETTE CONTROLLER

Your system comes with a built-in diskette controller. If you are adding a board that has a diskette controller, you must disable one of the diskette controllers. To disable the built-in diskette controller, you must adjust the JPF jumper located on the system board.

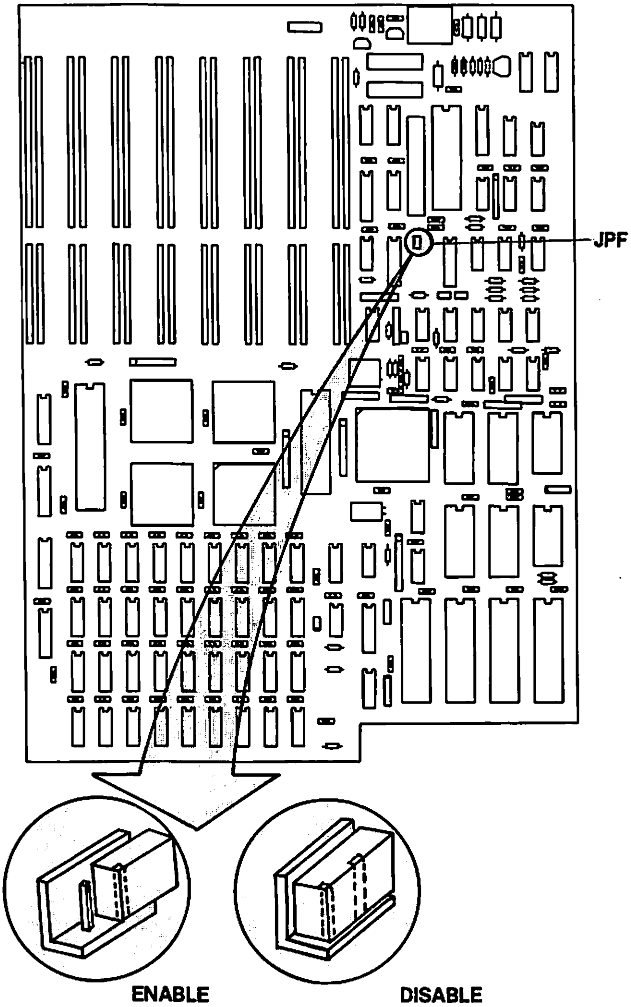


FIGURE 11–5. LOCATION AND PLACING PLUG OF JUMPER JPF ON THE SYSTEM BOARD

To make the adjustment, place a shorting plug over the JPF jumper. This disables the built-in diskette controller so that the diskette controller on the board you are adding can be used.

FOR YOUR NOTES

Chapter Twelve

Changing Your Computer's Configuration- The SETUP Prgram

Your computer comes with a program called SETUP that lets you define information about your specific computer such as the amount of memory installed. This information is called the configuration. Each time you start your computer, the configuration is checked by a part of the operating system known as **ROM BIOS** (Read Only Memory; Basic Input/Output System). The SETUP program is on the diskette labeled SETUP that comes with your computer. The SETUP program displays a menu from which you can set and define the following information:

- current date and time
- type of diskette drive(s)
- type of fixed disk (if your computer has one)
- type of monitor and column size
- type of memory added
- amount of memory
- frequency at which your computer processes information

The configuration for the particular computer model you have is set at the factory. You do not have to use SETUP unless you make changes to the hardware. The SETUP program is also used to change the time and date settings. Because of time zone differences, the time and date set for your computer may not be correct. If they are inaccurate, you will want to set them using SETUP after you install your computer.

NOTE: It is a good idea to make a backup copy of the SETUP diskette before you run the program. If you have not made a backup copy, see Chapter 8 for instructions.

USING THE SETUP PROGRAM

To use the SETUP program, insert the diskette labeled Supplemental in diskette drive A: (A: is the top drive if you have two diskette drives). To run the program, the **SETUP** following the system prompt, and then press the **Enter** key:

```
A>SETUP <Enter>
```

The menu shown in Figure 12-1 is displayed.

Your computer comes with a program called SETUP that lets you define information about your specific computer such as the amount of memory installed. This information is called the configuration. Each time you start your computer, the configuration is checked by a part of the operating system known as **ROM BIOS** (Read Only Memory; Basic Input/Output System). The SETUP program is on the system diskette that comes with your computer. The SETUP program displays a menu from which you can set and define the following information:

- current date and time
- type of diskette drive(s)
- type of fixed disk (if your computer has one)
- type of monitor and column size
- type of memory added
- amount of memory
- frequency at which your computer processes information

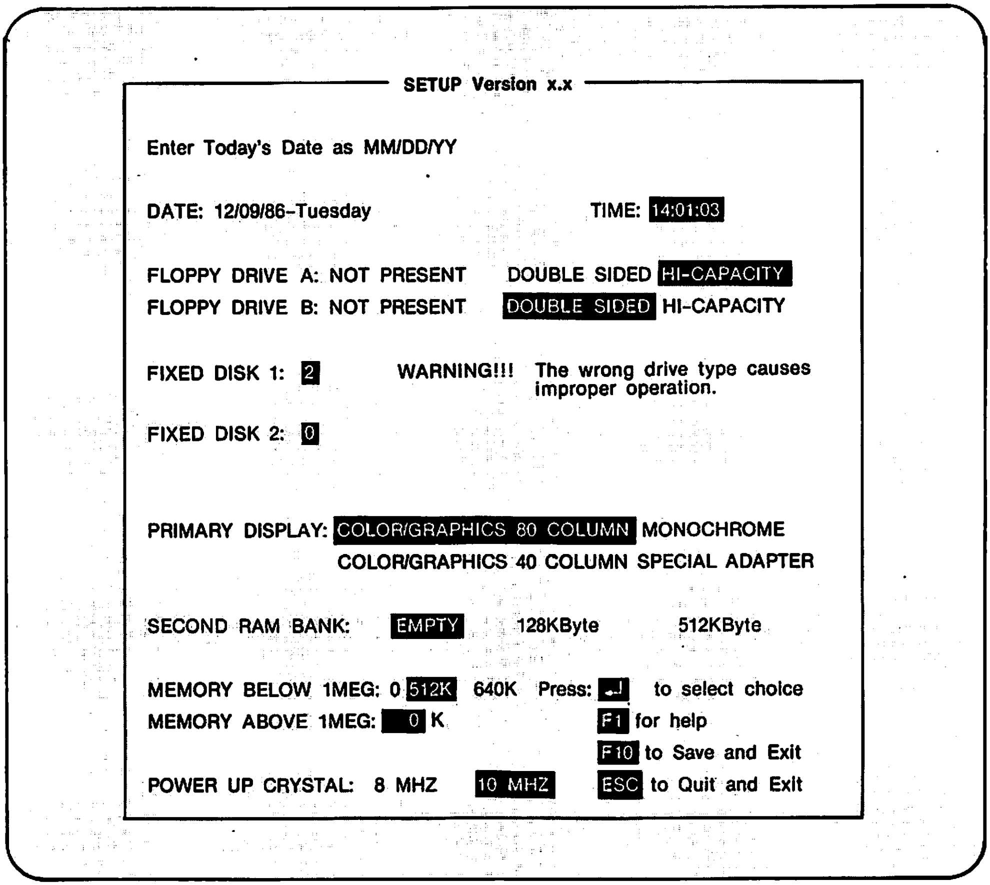
The configuration for the particular computer model you have is set at the factory. You do not have to use SETUP unless you make changes to the hardware. The SETUP program is also used to change the time and date settings. Because of time zone differences, the time and date set for your computer may not be correct. If they are inaccurate, you will want to set them using SETUP after you install your computer.

USING THE SETUP PROGRAM

To use the SETUP program, insert the system diskette in diskette drive A: (A: is the top drive if you have two diskette drives). To run the program, the **SETUP** following the system prompt, and then press the **Enter** key:

```
A>SETUP <Enter>
```

The menu shown in Figure 12-1 is displayed.



```
---------------------------- SETUP Version x.x ----------------------------

 Enter Today's Date as MM/DD/YY

 DATE: 12/09/86-Tuesday                          TIME: 14:01:03

 FLOPPY DRIVE A: NOT PRESENT    DOUBLE SIDED HI-CAPACITY
 FLOPPY DRIVE B: NOT PRESENT    DOUBLE SIDED HI-CAPACITY

 FIXED DISK 1: 2        WARNING!!! The wrong drive type causes
                                   improper operation.

 FIXED DISK 2: 0


 PRIMARY DISPLAY: COLOR/GRAPHICS 80 COLUMN MONOCHROME
                  COLOR/GRAPHICS 40 COLUMN SPECIAL ADAPTER

 SECOND RAM BANK:     EMPTY     128KByte       512KByte

 MEMORY BELOW 1MEG: 0 512K  640K  Press: ↵   to select choice
 MEMORY ABOVE 1MEG:    0 K               F1  for help
                                         F10 to Save and Exit
 POWER UP CRYSTAL:  8 MHZ   10 MHZ       ESC to Quit and Exit
```

FIGURE 12-1. THE SETUP MENU

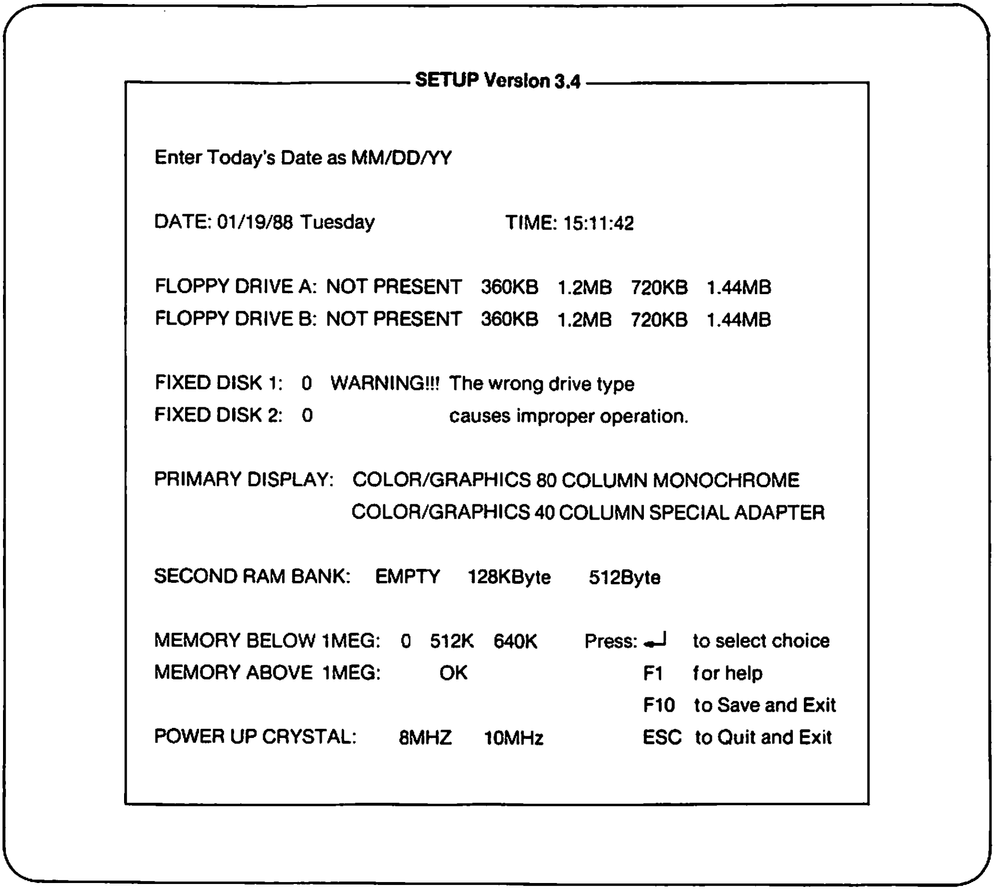
Select the information that matches your system's configuration on the SETUP menu. Use the cursor-control keys to move the cursor to the appropriate field or fields you want to select. A brief explanation of the currently highlighted field is displayed at the top of the screen. When you want to make a selection, press **Enter.** The field seleted remains shaded or highlighted and the cursor moves to the next line of fields.

If you make a mistake, use the cursor-control keys to return to a particular field and select a different option. If you want to start over, press **ESC.** This saves none of your current selections and returns you to the **DOS** system prompt.

When you have made all the necessary selections, press **F10** to save your choices and exit the program. A message is displayed asking you to press the **Enter** key. Your computer must be restarted before any configuration changes you have made take effect. Pressing the **Enter** key automatically restarts your computer.

GETTING HELP

If you need help while using the SETUP program, press **F1.** Pressing **F1** displays information about the field in which the cursor is located. To exit from the help facility, press **F1** again.



```
---------------------------- SETUP Version 3.4 ----------------------------

 Enter Today's Date as MM/DD/YY

 DATE: 01/19/88 Tuesday               TIME: 15:11:42

 FLOPPY DRIVE A:  NOT PRESENT   360KB   1.2MB   720KB   1.44MB
 FLOPPY DRIVE B:  NOT PRESENT   360KB   1.2MB   720KB   1.44MB

 FIXED DISK 1:  0   WARNING!!! The wrong drive type
 FIXED DISK 2:  0              causes improper operation.

 PRIMARY DISPLAY:  COLOR/GRAPHICS 80 COLUMN MONOCHROME
                   COLOR/GRAPHICS 40 COLUMN SPECIAL ADAPTER

 SECOND RAM BANK:   EMPTY   128KByte    512Byte

 MEMORY BELOW 1MEG:  0  512K  640K    Press: ↵   to select choice
 MEMORY ABOVE  1MEG:     OK                  F1    for help
                                             F10   to Save and Exit
 POWER UP CRYSTAL:    8MHZ    10MHz          ESC   to Quit and Exit
```

FIGURE 12-1. THE SETUP MENU

Select the information that matches your system's configuration on the SETUP menu. Use the cursor-control keys to move the cursor to the appropriate field or fields you want to select. A brief explanation of the currently highlighted field is displayed at the top of the screen. When you want to make a selection, press **Enter.** The field seleted remains shaded or highlighted and the cursor moves to the next line of fields.

If you make a mistake, use the cursor-control keys to return to a particular field and select a different option. If you want to start over, press **ESC.** This saves none of your current selections and returns you to the **DOS** system prompt.

When you have made all the necessary selections, press **F10** to save your choices and exit the program. A message is displayed asking you to press the **Enter** key. Your computer must be restarted before any configuration changes you have made take effect. Pressing the **Enter** key automatically restarts your computer.

GETTING HELP

If you need help while using the SETUP program, press F1. Pressing **F1** displays information about the field in which the cursor is located. To exit from the help facility, press **F1** again.

MOVING THE HELP WINDOW

When you request help, the information is displayed within a boxed area called a window. You can move the help window to another part of the screen by pressing **F2** and then using the cursor-control keys. The up and down arrow keys move the information up and down on the screen, and the left and right arrows move the information left and right on the screen as far as the left and right margin allow. To stop moving the help window, press **F2** again.

CHANGING THE SIZE OF THE HELP WINDOW

You can also change the size of the help window by pressing the **F2** and **End** keys, and then using the cursor-control keys to increase or decrease the number of lines in the help window. To stop changing the size of the help window, press the **End** key again.

DEFINING THE CONFIGURATION

The SETUP menu defines the following information:

DATE AND TIME

When you set the current date and time, the computer's internal clock (called a real-time clock) keeps track of the correct time and date automatically even when your computer is turned off. Once you set the date and time, you do not need to reset them unless you change time zones or switch to daylight savings time and back.

You must enter the date in the following fromat: mm/dd/yy (month, day, and year). For example, to enter June 5, 1986, you would type 06/05/86. The time must be entered as hh:mm, in 24-hour or military notation. For example, to enter 4:30 A.M., you would type 04:30. To enter 4:30 P.M., you would type 16:30.

FLOPPY (DISKETTE) DRIVES

Indicate if diskette drive A: and/or B: are present. If you do not have a particular drive, select **NOT PRESENT.** For the drives you do have, indicate whether they are normal capacity (double-sided) or high-capacity.

FIXED DISK

Indicate whether or not your computer has a fixed disk, and, if it does, indicate its type. Select the **NOT PRESENT** option to indicate that your system does not have a fixed disk. If your computer has a 20-megabyte fixed disk that came with your system, select type 2, the factory setting. If your system has a 40-megabyte fixed disk that came with your system, select type ???, the factory setting. If you have added your own fixed disk, refer to following table that came with the fixed disk to determine its type.

Definitions of predefined fixed disk drive types;

Disk Type	Cylinders	Heads	Write Pre-comp	Landing Zone	Capacity per Drive
1	306	4	128	305	10MB
2	615	4	300	615	21MB
3	615	6	300	615	31MB
4	940	8	512	940	64MB
5	940	6	512	940	48MB
6	615	4	no	615	21MB
7	462	8	256	511	31MB
8	733	5	no	733	31MB
9	900	15	no	901	115MB
10	820	3	no	820	21MB
11	855	5	no	855	36MB
12	855	7	no	855	51MB
13	306	8	128	319	21MB
14	733	7	no	733	44MB
15	Reserved-set to zeros				

MOVING THE HELP WINDOW

When you request help, the information is displayed within a boxed area called a window. You can move the help window to another part of the screen by pressing **F2** and then using the cursor-control keys. The up and down arrow keys move the information up and down on the screen, and the left and right arrows move the information left and right on the screen as far as the left and right margin allow. To stop moving the help window, press **F2** again.

CHANGING THE SIZE OF THE HELP WINDOW

You can also change the size of the help window by pressing the **F2** and **End** keys, and then using the cursor-control keys to increase or decrease the number of lines in the help window. To stop changing the size of the help window, press the **End** key again.

DEFINING THE CONFIGURATION

The SETUP menu defines the following information:

DATE AND TIME

When you set the current date and time, the computer's internal clock (called a real-time clock) keeps track of the correct time and date automatically even when your computer is turned off. Once you set the date and time, you do not need to reset them unless you change time zones or switch to daylight savings time and back.

You must enter the date in the following fromat: mm/dd/yy (month, day, and year). For example, to enter June 5, 1986, you would type 06/05/86. The time must be entered as hh:mm, in 24-hour r military notation. For example, to enter 4:30 A.M., you would type 04:30. To enter 4:30 P.M., you would type 16:30.

FLOPPY (DISKETTE) DRIVES

Indicate if diskette drive A: and/or B: are present. If you do not have a particular drive, select **NOT PRESENT.** For the drives you do have, indicate whether they are normal capacity (360KB), high-capacity (1.2MB and 1.44MB) and quadcapacity (720KB).

FIXED DISK

Indicate whether or not your computer has a fixed disk, and, if it does, indicate its type. Select the **NOT PRESENT** option to indicate that your system does not have a fixed disk. If your computer has a 20-megabyte fixed disk that came with your system, select type 2, the factory setting. If your system has a 40-megabyte fixed disk that came with your system, select type ???, the factory setting. If you have added your own fixed disk, refer to following table that came with the fixed disk to determine its type.

Definitions of predefined fixed disk drive types;

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4	940	8	512	940	64MB
5	940	6	512	940	48MB
6	615	4	no	615	21MB
7	462	8	256	511	31MB
8	733	5	no	733	31MB
9	900	15	no	901	115MB
10	820	3	no	820	21MB
11	855	5	no	855	36MB
12	855	7	no	855	51MB
13	306	8	128	319	21MB
14	733	7	no	733	44MB
15	Reserved-set to zeros				

Disk Type	Cylinders	Heads	Write Pre-comp	Landing Zone	Capacity per Drive
16	612	4	0	663	20MB
17	977	5	300	977	41MB
18	977	7	no	977	58MB
19	1024	7	512	1023	60MB
20	733	5	300	732	31MB
21	733	7	300	732	43MB
22	733	5	300	733	31MB
23	306	4	0	336	10MB
24	Reserved-set to zeros				
25	615	4	0	615	20MB
26	1024	4	no	1023	34MB
27	1024	5	no	1023	43MB
28	1024	8	no	1023	69MB
29	512	8	256	512	34MB
30	Reserved-set to zeros				
31	Reserved-set to zeros				
32	Reserved-set to zeros				
33	Reserved-set to zeros				
34	Reserved-set to zeros				
35	1024	9	1024	1024	78MB
36	1024	5	512	1024	43MB
37	830	10	no	830	70MB
38	823	10	256	824	69MB
39	615	4	128	664	20MB
40	615	8	128	664	41MB
41	917	15	no	918	116MB
42	1023	15	no	1024	130MB
43	823	10	512	823	69MB
44	820	6	no	820	41MB
45	1024	8	no	1024	69MB
46	925	9	no	925	70MB
47	699	7	256	700	41MB

PRIMARY DISPLAY

Indicate the type of display monitor connected to your computer-color or monochrome. If you have a color monitor, you must also indicate whether you are using the monitor in 80-column or 40-column mode. If you are using your television as a monitor, you must select 40-column mode. Monochrome monitors can only be used in 80-column mode. If you have an enhanced color monitor that uses an enhanced color adapter for higher resolution, select the SPECIAL ADAPTER field.

SECOND RAM BANK

Indicate whether you have added memory using a memory board or using memory chips. If you have not added memory, or you have added a memory board, use the default selection **EMPTY.** If you have added memory chips to increase memory, select 128KByte or 512 KByte.

MEMORY

Indicate the amount of memory below or above one megabyte your computer has. Your computer comes with 512 KB of memory. If you have not added any memory, select 512K. If you have added 128 KB of memory (using 64Kbit or 256 Kbit DRAMs) to your computer, select 640K. If you have added more than 128 KB of memory, enter the total memory of your computer in the field **MEMORY ABOVE 1MEG.**

Following chart shows combination for the system memory set up.

Memory Selection Table

SETUP Menu RAM Device	Second RAM BANK	Below 1MEG	Above 1MEG	Total Memory
0	EMPTY	512KB	0	512KByte
64KBit DRAMs	128KByte	640KB	0	640KByte
256KBit DRAMs	128KByte	640KB	0	640KByte
256KBit DRAMs	512KByte	512KB	512KB	1024KByte

*1ST BANK: Only 512KByte (256K Bit DRAMs)

POWER UP CRYSTAL

Indicate the frequency at which your computer processes information. The default is 10 MHz (10 megahertz). You only need to select the 8 MHz (8 megahertz) option if you are running a program that cannot run at the faster speed.

NOTE: You can also change the frequency without using the SETUP program by pressing the **Ctrl, Shift,** and **Num Lock** keys. These keys work as a toggle. When you press them once the frequency changes from its present setting to the opposite; when you press them again, the frequency changes back. So that you know which frequency you are setting, you will hear one beep if you have changed to 10 MHz, and you will hear two beeps if you change to 8 MHz.

Using the **Ctrl, Shift,** and **Num Lock** keys only sets the frequency until you turn your computer off or until you reset it using the **SETUP** program.

FOR YOUR NOTES

Chapter Thirteen

Glossary

Following is a list of computer terms that you may find in this and other computer guides.

APPLICATION PROGRAM
Software written for a specific use, such as word processing, accounting, inventory, or property management.

BACKING UP
The process of making copies of the files contained on your fixed disk or diskettes. This duplication is done in case something happens to your working (or original) copy of the information.

BASIC
An acronym for Beginner's All-purpose symbolic Instruction Code. BASIC is a programming language commonly used both by first-time programmers and by owners of computers because it is simple to learn and it uses common English commands.

BAUD
A measure of the rate of transfer of information across a medium. The measurement is expressed in bits per second. You might measure the transfer rate between two computers or between a computer and its printer. A transfer rate of 1,200 baud means that 1,200 bits of information are being transferred every second.

BINARY
A numbering system with 2 as its base. In the binary numbering system, each digit of a number is a power of 2. The only numerals used in this system are 0 and 1. Each binary digit is called a bit and has a value of either 0 or 1. (The decimal system has 10 as its base—each digit of any number is a power of 10. The decimal number system uses the numerals 0 through 9 to form all its numbers.)

BIT
A contraction of "binary digit." A bit is the smallest single unit of measure recognized by your computer, and each bit has a value of either 0 (off) or 1 (on).

BOARD
A term used to refer to a printed circuit board. It is a flat plastic surface on which electronic circuits and chips are mounted. Boards are also referred to as "cards"

BOOT
The process of copying the operating system into a computer's memory, usually from a diskette or fixed disk. Once the operating system is copied, you can begin your processing. To reboot is to recopy the operating system into memory. Booting is also referred to as "startup".

BYTE
A sequential group of bits used by the computer to represent one piece of information, that is, a single character, such as "A", "b", or "+". On your computer, a byte is composed of 8 bits, but since it is a 16-bit machine it processes two bytes (or 16 bits) at a time.

CARD
Another term for "board".

COLD START
To load the operating system system into your computer's memory by turning the system power on. This is also called a "cold boot".

COMPONENT
A baisc part or an element. Your computer system is composed of three main components: the monitor, the keyboard, and the system unit. These three parts are composed of smaller components, such as the integrated circuits (chips) on a board.

COMPUTER
A device used to process, store, and retrieve information. It is an electronic machine composed of physical parts (hardware) that contain precoded instructions (software). Together, the hardware and software perform rapid and often complex calculations and procedures.

CONFIGURATION
A type or variety of items defined by the collection and arrangement of specific parts. The computer described in this guide comes in four different configurations: Model 1 with one diskette drive; Model 2 with two diskette drives; Model 3 with one diskette drive and a fixed disk drive; and Model 4 with one diskette drive, one fixed disk, and one tape backup drive.

DEFAULT
A preset value or state that you can alter or keep the same. For example, when you first turn on your computer system, the default printer port is the parallel port. If your printer is attached here, you may go ahead and print. If it is attached to the serial port, you must use the MODE command (see Section 2, MS-DOS User's Guide) to alter the default printer port to be a serial port instead of the parallel port.

DIP SWITCH
DIP is an acronym for Dual In-Line Package which is a small device composed of various switches, each of which can be either on or off. The setting of these switches tells your computer system how it is configured. The main system **DIP** switch on your computer is located on the System Board.

DIRECTORY
A portion of the beginning of a fixed disk or diskette reserved for a list of the files that are stored on the device. Each entry in this list records the filename along with information about the file.

DISKETTE
A type of removable storage medium that looks like a flimsy 45 r.p.m. record, used to store information magnetically for future retrieval. Diskettes are also referred to as "floppies".

DISPLAY MONITOR
The small television-like screen used with your system unit to display characters and pictures.

DOS
An acronym for Disk Operating System. The DOS for your computer is MS-DOS (Microsoft's Disk Operating System. See "Operating System" for more information.

FILE
A logical division of your fixed disk or diskette that is based on a collection of common information. For example the collection of words that make up a document is a file. Each file is identified by a unique name, known as its filename.

FILENAME
The name used to identify a file on your fixed disk or diskette.

FIXED MEDIA
Storage media that cannot be removed from your computer. A fixed disk is a type of fixed medium.

FIXED DISK
A type of fixed medium that resides permanently in your computer system and magnetically stores information for future retrieval. This type of storage can record much more information than a diskette and can also retrieve the information much faster.

HARDWARE
The mechanical and electronic components of your computer system, such as the diskette drive, the fixed disk, the system unit, the display monitor, and the keyboard.

HEXADECIMAL
A numbering system with 16 as its base. In the hexadecimal numbering system, each digit of a number is a power of 16. The numerals used in this system are 0 through 9 and A through F. A through F correspond to our familiar 10, 11, 12, 13, 14, and 15. (The familiar decimal system has 10 as its base—each digit of any number is a power of 10. The decimal number system uses the numerals 0 through 9 to form all its numbers.)

INSTALLATION
The process of setting up, connecting, and adjusting the various components of your computer system.

INTERFACE
The area that forms the connection between two parts.

KEYBOARD
The typewriter like portion of your computer system. It contains not only typewriter letter and number keys, but also many special keys to help you do your work faster.

KILOBYTE (K OR KB)
A measurement equivalent to 1,024 bytes (1K = 1Kb = 1,024 bytes). (Since the prefix "Kilo" means 1,000, the literal definition of a kilobyte is actually 1,000 bytes. In the world of computers, however, it refers to 1,024 bytes, because it represents 2 to the tenth power.) It is used to measure the amount of internal memory in your computer system or the amount of space on a diskette. The larger the amount of internal memory or storage space something has, the more information it can store.

MEGABYTE (MB)
A measurement equivalent ot 1,024 kilobytes (1,024 bytes × 1,024 bytes = 1,048,576 bytes). Since this measurement is so large, it usually refers to the amount of space on a fixed disk drive (a very large capacity storage device).

MEMORY
A storage area inside your computer that receives, compares, and processes data temporarily until the data is ready to be stored permanently on a diskette or fixed disk. Your computer comes with 512 KB of memory, but if wish you can add more.

MICROPROCESSOR
A single chip, smaller than your thumbnail, which is the actual computer (the component that does all the processing) in your computer system. It is usually encased in a larger package with pins that plug into circuit boards.

MODEM
Shortened version of MOdulator DEModulator. A device that allows computers to communicate with one another over telephone lines. It converts (modulates) the digital signal of your computer into an analog signal that can be transmitted over a phone line, and then reconverts (demodulates) the analog signal from the phone line back into a digital one that can be understood by your computer.

OPERATING SYSTEM
A set of precoded instructions that controls how the hardware of your computer system processes, retrieves, and stores data; displays or prints information; and communicates with other computer systems. The operating system (or OS as it is often called) for your computer is MS-DOS (Microsoft's Disk Operating System).

PARALLEL
A type of communication interface used to transfer information between locations. This type of interface passes eight bits (one byte) of data at a time.

PARAMETER
A piece of information that can optionally be provided as part of a command you issue to the computer. Your command performs different functions depending on the parameters you supply. For example, the DIR command lists the names of the files on the drive you are currently using. If you change your command to DIR C:, the files on drive C: are listed even if your current default drive is A:. In this example C: is a parameter that modifies how the DIR command performs.

PARTITION
A logical division of your fixed disk into areas that contain different operating systems.

PIXEL
Shortened version of "picture element". It refers to an individual dot displayed on your monitor. These dots form the characters or graphics that you see on your monitor. The more pixels there are per square inch, the finer the detail of each character.

PORT
A connection point on your computer through which different devices (your monitor, printer, modem, and so forth) communicate with the computer system. Through these connection points, data is passed back and forth between the computer and other devices. The ports that you most commonly access on your PC are the serial and parallel ports located on the adapter board that comes with your system. If you connect a printer to your computer system, you connect it to one of these ports.

PROGRAM
A set of precoded instructions grouped together to perform a variety of tasks. Instructions are stored in a file on your diskette or fixed disk and must be copied into your computer's memory before they can be executed.

RAM
An acronym for Random Access Memory, the memory inside your computer system. It contains the operating system, any programs you are running, and any information (data, document, and so forth) associated with that program. The computer can read from and write to this portion of memory. Your computer has a minimum of 512 KB of RAM. This can be expanded if you want.

REMOVABLE MEDIA
Storage media that can be removed from your computer system. Removable media can be placed in the system to be used and then removed for storage in a safe place. A diskette is a type of removable medium.

RESET
The process of reloading the operating system into your computer's memory. This is done either by pressing the reset button on your system or by pressing the Ctrl, Alt, and Del keys simultaneously. A reset is also known as a "warm start" or a "warm boot".

ROM
An acronym for Read-Only Memory. This is the memory inside your computer system that contains a special part of the operating system that can only be read. It cannot be written to or modified. Your computer has 64 KB of ROM.

SERIAL
A type of communication interface used to transfer information between locations. This type of communication passes one bit of data at a time.

SOFTWARE
A set of precoded instructions to be followed in a precise and logical manner. These instructions are stored in files on your diskette or fixed disk.

SURGE PROTECTOR
A device that looks like an extension cord, used on your AC power line to monitor and shield against intermittent changes in current. This device helps minimize or prevent these potentially harmful fluctuations. It is sometimes called a "surge suppressor."

SYSTEM PROMPT
The character indicator displayed on your monitor when the system is ready for input. The system prompt on your PC is always a capital letter accompanied by a "greater-than" sign, that is, A> or C>.

SYSTEMS UNIT
The large rectangular base portion of your computer system that contains the diskette drive(s), fixed disk, power supply, and system boards.

WARM START
See "Reset."

APPENDIX
SYSTEM UTILITIES

DISKINIT.COM

Name

Diskinit

Purpose

Initializes fixed disk drives for use MS-DOS and your computer.

Syntax

diskinit

Comments

The **Diskinit** utility is a fixed disk drive initialization program that should be used only on new fixed disk drives or fixed disks that fail to come up after having been formatted and partitioned.

Note

You should exercise extreme caution when using **Diskinit. Diskinit** erases all the data on your fixed disk. Generally, **Diskinit** should be used only on a brand new fixed disk.

Diskinit must be run from a floppy drive. To begin, insert your **System Diskette** in drive A.
Then type **Diskinit** and press <ENTER >.

You will see a screen similar to the following:

```
DISKINIT Utility Ver x.xx

The contents of disk will be destroyed.
Press <RETURN> to continue or <ESC> to exit [-].
```

Be extremely careful how you answer this prompt.

Note

If your **System Diskette** is labeled **MS-DOS Ver 3.20** and you want to abort the program at this point, **DO NOT** answer by typing <RETURN>— this will cause irrecoverrable damage to the contents of your fixed disk. You should exit the program by pressing <ESC>.

To run the **Diskinit** program and erase the entire contents of your disk, type <RETURN>.

The program displays the message,

```
Current Cylinder XXX Head Y
```

XXX, Y indicates current initialization head position.

The program starts initializing from end of cylinder.

After initialization, the program displays following message and starts detecting defective cylinder.

```
Checking...
Current Cylinder XXX Head Y
```

XXX, Y indicates current checking head position.

If there are no defective cylinders, the following message is just displayed and the program exits to **DOS.**

```
Checking Completed
```

But, there are defective cylinders, the program will display the following message. For example,

```
Defective
Cylinder & Head
     302    3
     120    0

Checking completed
```

You should now run **FDISK** on your hard disk, and then **FORMAT** it. Instructions to use **FDISK** are included in **Appendix F "CONFIGURING YOUR HARD DISK (FDISK)"**, and instructions to use **FORMAT** are in Chapter 3 of the **MS-DOS USER'S GUIDE.**

SHIPDISK.COM

Name

Shipdisk

Purpose

Positions the heads of the fixed disk over the inner track where no datas are written.

Syntax

shipdisk

Comments

This program moves the fixed disk heads to the inner tracks where no datas are written, thus helping protect your fixed disk—and the data on it—from damage.

This program may eliminate damage when—some one bumps into your computer or an earth—quake shakes your system.

In addition, **SHIPDISK** can reduce the chance of losing data when you move your system. To ensure the integrity of your data, always run **SHIPDISK** before you turn off a system with a fixed disk.

After you execute the **SHIPDISK** command, the following message appears on your monitor screen:

```
Shutdown Utility          Ver x.xx

Drive C: Shutdown cylinder = XXX

Shutdown Completed-OK Turn Power OFF
                       or <ESC> Cancel
```

The value of XXX will be landing zone of fixed disk.
For more detail landing zone, refer to **Chapter 12 "SETUP PROGRAM"** of operations manual.

YOU SHOULD CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE OPENING THIS DISKETTE PACKAGE. OPENING THE PACKAGE INDICATES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THEM, YOU SHOULD PROMPTLY RETURN THIS PACKAGE UNOPENED, AND YOUR MONEY WILL BE REFUNDED.

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